# Railway Age
AND RAILWAY REVIEW

RST HALF OF 1928—No. 24 JUNE 16, 1928 SEVENTY-THIRD YEAR






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# Railway Age

Vol. 84 June 16, 1928 No. 24


*"Sunset Limited" crossing the Mississippi on Southern Pacific Car Ferry.*

# Contents




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# Showing Shippers Advantag

THE new Boston yards of the Bos and Maine Railroad were dedi ed before a large gathering of r resentatives from all parts of New Engl on June 5, 1928.

The improvements, consisting of an bound and outbound yard, handle classifications for the Boston Termi district which were formerly perfor in nine different yards.

The cost of the improvements \$4,000,000 and 1,000,000 cars are ha led yearly with additional capacity for handling 1,000,000 more cars.

Representative Shippers arriving for Inspection of the Yards and Demonstration of how Car Retarders speed up classification

# Railway Age

Vol. 84, No. 24 — June 16, 1928 — Table of Contents Appears on Page 5 of Advertising Section


## The Biennial "Railroad Show"

THE A. R. A. conventions held in even years in Atlantic City, with the supply manufacturers exhibiting their latest developments in the interest of greater efficiency and economy, are growing constantly in the breadth of their appeal. This year a new division of the American Railway Association, the Motor Transport Division, will meet concurrently with the Mechanical and Purchases and Stores Divisions and the Association of Railway Electrical Engineers. The exhibits which will be on display at the Million Dollar Pier, the adjacent Marine Hall and on tracks, while directed primarily toward the four groups in convention, will be of sufficient diversity to interest railroad men whatever their departmental affiliations. The fact that railroading covers such a range of activities and has so many thousands of officers and employees militates against a centralized convention and exhibition covering all departments. However, the Atlantic City exhibits with their concurrent conventions of four different railroad groups cover a wide range. Railroad men of all departments who can visit Atlantic City between June 20 and 28, whether they go to attend any of the conventions there or not, will find a "railroad show" which will well repay their time.

## A Question of Authority

IN so far as the construction of major mechanical facilities such as cinder pits, roundhouses, shops, etc., are concerned the engineering department bears a relation to the mechanical department that has a striking similarity to that of the purchasing department. The engineering department is responsible for the design and construction of facilities which the mechanical department must use, but the chief engineer also has a vital interest in the completed structure since his organization is responsible for its maintenance and, in the case of water treating plants, for its operation as well. In general it may be said that the using department should have the last word with respect to the size and arrangement of facilities, and the construction organization with respect to structural design, materials of construction, etc. This simple rule sufficed in the days when a roundhouse or a shop was merely an enclosure in which certain work was performed, but with the rapid development of auxiliary utilities with respect to which both operation and maintenance have an important influence on selection, the relationship of the two departments has become more involved and can easily lead to extended controversies. The problem thus created cannot be solved as it was in the days of old when the "old man" deemed it his prerogative to settle all matters on the basis of his own personal knowledge or experience. Today, no one man can be sufficiently conversant with the intricacies of all special fields to hazard a solution without guidance from qualified authorities. The problem is therefore, primarily one of management, of discovering those means of contact between departments, whether through joint committees, liaison officers, or the like, which will insure a satisfactory meeting of the minds.

## Protection of Wages

AN order issued by the Central of Georgia is in line with state and municipal campaigns to put a quietus on the loan sharks. The order is directed against those who have been "buying" salaries and wages of employees of that road. The new order establishes a policy set forth in the following five provisions:

1. Partial assignments of wages are disregarded.
2. When salary assignments are apparently of money-lending origin or infected with usury, every assistance or opportunity shall be accorded the employee in resisting such contracts in the courts.
3. An employee will not be discharged from service by reason of having assigned his wages or because his wages have been garnished, except in flagrant cases, and then only after investigation and an opportunity for the employee to explain the reasons for such assignments or garnishments.
4. Portions of the wages which are exempt by law shall be paid over to the employee and not held up until the garnishment is satisfied.
5. Employees shall be encouraged in organizing among themselves credit associations.

This is a step for the protection of the employees and also for creating improved relationships between the management and the employees that should be productive of excellent results. It is in line with a well considered program on the part of the Central of Georgia for welding that property into one large enthusiastic and efficient family.

## Operating Cost Data

THE decentralization of accounting continues to be adopted on more railways, the St. Louis-San Francisco and the Central of Georgia being the most recent additions to the list. Apart from the purely auditing features, this method of handling accounts by districts or divisions is significant to the operating department. The value of current cost figures is indisputable, and, by the establishment of accounting units in various parts of the system, operating cost data are made available much more quickly than has hitherto been the case. On roads where the superintendents are required to work within a fixed budget, as on the Illinois Central, these data are invaluable, and divisional accounting offices are necessary. But cost data are valuable to any operating officer, provided they are made available to him within a reasonable period after the operations they cover have

transpired. It is a manifest fact that a supervisory officer is in a much better position to control costs if he knows what those costs are. The Northern Pacific has carried out the theory of current operating cost data to the extent that daily cost figures are supplied to all its yardmasters and to the agents at the larger stations. The benefits accruing from this system were described in the *Railway Age* of January 21. There is a real need for more current cost data in the operating department and operating officers should interest themselves in the benefits accruing to them from decentralized accounting.

## *A Pole Line for Signaling*

*WHEN* planning a signal installation or a combination signal and train control installation, one of the first questions that arises is whether to construct a separate pole line, or to add a crossarm to the existing telegraph lead, to carry the signal power and control wires. On lines where the telegraph lead is comparatively light and direct current signaling is being installed, a majority of the roads have, in the past, seen no justification for a separate pole line, but have added another crossarm to the existing poles, and in many cases used weatherproof signal line wire. Advocates of the separate pole line contend that, especially where the telegraph lead carries many wires, there is constant danger of crosses on signal control circuits, one road reporting that 90 per cent of the false-clear signal failures on such territories are due to line crosses. Thus while local circumstances and available funds of necessity influence the decisions, there is a valid argument for the provision of a pole line for telephone and signal wires, separate from the lead of the commercial telegraph company. The extent to which this conclusion is being accepted is evident from a study of the statistics of signaling installed last year, for on the 5,127 miles of road equipped with automatic signaling a separate pole line was constructed for the signaling on at least 2,949 miles. A majority of the roads building new pole lines are using the best standards of modern construction, including creosoted poles, with the idea that strength to withstand storms for years to come is a necessity for this type of service.

# How Are Your Labor Camps?

DISCUSSIONS appearing in the New York daily papers recently relative to unemployment, and more particularly relative to the trickery of labor agencies and unsatisfactory conditions prevailing in railway labor camps, are almost sufficient to brand the railways, in the eyes of the public, as being willfully neglectful and inhumane. It is claimed that labor agencies, in league with labor bosses, are exploiting labor, hiring and discharging men without provocation solely to collect an office fee; that men are forced to patronize camp commissaries where prices are exorbitant and the articles of poor quality; that the men are crowded into dirty and poorly ventilated houses and dilapidated box cars and coaches; that the bedding provided is poor, dirty and unsanitary; and that the food served is insufficient in quantity, lacking in nourishment, and poorly prepared.

No one is in a position to disprove these accusations for the railways as a whole, and it is possible that this could not be done from the facts in the case. On the other hand, it is slander of the worst order, and a grave injustice to many roads and labor agencies to have these blanket charges broadcasted and made against all alike. Never before have the railroads evidenced more interest in their employees than at the present time, and never before have they given as much attention to providing their labor camp forces with clean and comfortable quarters and plenty of nutritious well-prepared food. In view of this general tendency there is an increasingly large number of roads which can deny every accusation that has been made. The same can be said with regard to the activities of many labor agencies. The brunt of the charges made should fall, therefore, on those roads which may still handle this matter with a slack hand. With the class of extra track labor which the railways are forced to accept and feed and house in many localities, there are few problems more difficult than to maintain clean and orderly labor camps, for few facilities can deteriorate more rapidly than a labor camp where the attention of the management is allowed to lapse. To supervise, maintain and run these camps is not the duty of the higher railway engineering officer, but to see that they are supervised, maintained and run in a manner beyond the reproach of fair-minded labor, is his duty, and one which he cannot afford to neglect.

# Decline in Railway Expenditures

THE effect that adverse influences, especially the decline in their net operating income, are having upon the expenditures of the railways for the improvement and maintenance of their properties is illustrated by recent statistics which have been compiled by the Bureau of Railway Economics and the Interstate Commerce Commission. The amount of capital invested in new equipment and other improvements in the first quarter of this year was only $128,428,000, a decrease of $26,594,000 as compared with the corresponding period of 1927, and of $37,327,000 as compared with the first quarter of 1926. Expenditures for locomotives declined from almost $20,000,000 to about $10,500,000 and for freight cars from about $18,200,000 to about $13,600,000. Total expenditures of new capital authorized for 1928 up to April 1 amounted to about $594,000,000 as compared with authorizations of $725,000,000 on the same date in 1927, and of $822,000,000 on the same date in 1926.

The same downward tendency is shown in expenditures for maintenance, which amounted to $502,000,000 in the first quarter of 1927, and to only $472,000,000 in the first quarter of 1928, a decline of $30,000,000. The decreases in expenditures for improvements and maintenance combined, in the first quarter, amounted to about $57,000,000. The reductions in capital and maintenance expenditures have been partly due to the fact that the volume of traffic thus far this year has been smaller than in either 1926 or 1927, but unquestionably it has been due in much larger measure to the decline in the net operating income earned, which was relatively less in the first four months of this year than in the corresponding part of any year since 1922. This decline in net has been only partly due to the decrease in freight business, and more largely due to losses of passenger business, reductions of freight rates and advances in wages. The present effect of the reduction in railway expenditures is to contribute towards a general slowing down in industry, and especially in the iron and steel, equipment building and affiliated industries. A more important future effect, if conditions make necessary a continuance of the policy, will be the deterioration of railway service.

The railways were never so efficiently operated as recently. In the first three months of this year they made a new low record of fuel consumption in proportion to the service rendered and new high records of average cars per freight train, gross tons per train and average speed of freight trains. Their poor showing of earnings has been due to wages, taxes and other expenses that are too high in proportion to the rates they are allowed to charge.

## Pension Plans and the Contractual Feature

MENTION was made in an editorial on "Pension Plan Tendencies in Other Industries" in the *Railway Age* of June 2, 1928, page 1264, of the emphasis which the Carnegie Foundation for the Advancement of Teaching places upon the importance of a contractual feature in industrial pensions.

What promises to become a classic example of what may happen if the employees are not properly safeguarded in this respect was a pension plan installed by Morris & Co. in 1909. Employees contributed three per cent of their salaries up to $7500 a year; the company was obligated to contribute $25,000 a year until the fund reached $500,000, but beyond this there was nothing in the way of a written contract to obligate it further. In 1922 Morris & Co. was merged with Armour & Co., which had a somewhat similar pension plan. Morris & Co. employees, who were retained, were taken into the Armour pension fund on practically the same basis as with Morris & Co., but those employees who were not taken over, or who were already on the pension roll of Morris & Co., found themselves in a most embarrassing situation. Active employees not engaged by Armour & Co. had their accumulations returned to them. After the obligations had been met, there is said to have been about $320,000 in the Morris fund. Morris & Co., whose liability was limited to the above-mentioned $500,000, had already contributed additional sums said to amount to about $980,000. The members of the Morris family made a gift of $500,000 to the fund, but this sum provided allowances for the four hundred and more Morris pensioners and former employees who were retired, or about to retire at the time of the merger, for a period of some 18 months only. More than two years before this, the report of the Special Committee on Industrial Pensions of the Merchants' Association of New York, contained the following paragraph as the third of its six findings: "The legal obligation laid upon the corporation should be carefully considered. The corporation is quite right in providing that it reserves the right to alter the rules, or to free itself entirely from the pension obligation. It should be possible always to utilize experience, even to the extent of abandoning the entire undertaking. But such reservations should always be prospective only; they should never take effect retroactively. To provide, as is often done, that the corporation may wind up the pension plan at any time without fulfilling the promises already made, and then to expect employees to look forward with confidence and order their lives upon the strength of these promises, is certainly inconsistent. When the economic aspect of pensions is considered, such retroactive power of revocation can hardly be considered as moral."

One of the most comprehensive and thorough studies of industrial pensions in the United States was that published by the National Industrial Conference Board in 1925. In discussing the question of financial security of pension plans, it stated: "Pension plans of the contractual type, even in its limited form, i.e., where the guarantee applies only to existing pensions, are relatively rare." Again, in the final chapter of the report we find this statement: "The discretional feature, now so prominent in most pension plans, should be retained, if at all, only within narrow limits. Either the promise of a pension from an employer involves an obligation upon him, or it does not. If not, such a promise may easily raise a doubt as to the employers' sincerity and thus defeat its own purpose. If the obligation is really assumed, on the other hand, it should be clearly acknowledged and provided for, although the right of final decision may be reserved by the employer for certain situations and contingencies."

The concluding paragraph of the National Industrial Conference Board's report is of peculiar significance at this time, because of the pension plan discussion which has been carried on in these columns. It reads thus: "In conclusion, it cannot be too often emphasized that a policy of early funding on a scientific basis is the essence of economy and good psychology for a pension system that is to remain solvent. If a system has been started without adequate financial provision for meeting the cumulative pension costs of the future, the first essential step toward placing it on a permanently sound foundation, is to make an actuarial valuation of liabilities under the plan. In the light of the facts and forecasts thus established, the employer may find it desirable to revise his plan, so as to give clear definition to his obligations and to accord them contractual validity. He may then proceed to finance the plan upon a reserve basis, thus securing it against eventual insolvency, himself against embarrassment, and his faithful employees against distress in their old age."

In the light of the findings from the various authorities above referred to, certain questions naturally present themselves. Are the discretional features in the formal pension plans of the railroads now within sufficiently "narrow limits"? What steps, if any, must be taken to insure a railroad pension plan remaining solvent, particularly in the knowledge of the rapidly increasing pension costs and the fact that the peak will not be reached for many years? How will it be possible for the railroads to institute a policy of "early funding on a scientific basis"?

## Hoch on Rate Regulation

THE Hoch-Smith resolution threatens to become one of the most important pieces of railway legislation ever passed by Congress. As was inevitable, widely different interpretations have been placed upon it. Those who have emphasized those of its provisions indicating that it contemplates the making only of "lawful rates," and regulation that will assure adequate transportation, have interpreted it as meaning almost nothing not meant by previous legislation. Those who have been especially impressed by its declaration that the future policy in rate making should be to give consideration to the conditions existing in the various industries at any given time, and especially that, owing to the "existing depression in agriculture," the lowest possible lawful rates should be made on farm products, have interpreted it as contemplating a revolution in rate-making.

Representative Homer Hoch of Kansas is the principal author of the resolution, and therefore should know better than anyone else its purpose and the means it was intended should be adopted to carry it out. In a recent letter to Chairman Campbell of the Interstate Commerce Commission Mr. Hoch has given his inter-

pretation of it, and it is a highly significant one. He takes the position that, as the commission is merely the agent of Congress, the reference in the resolution to the existence of an agricultural depression should have been accepted by the commission as establishing for all its purposes the fact that an agricultural depression did exist. "I think," says Mr. Hoch, "that the commission was not only justified in assuming the existence of an agricultural depression, but that, in fact, it was not necessary for the commission to assume anything at all about that, but simply to follow the mandate of Congress to readjust farm freights in order to give them a preferential status within the zone of 'just and reasonable' rates."

Of course, if Congress, by merely declaring that certain conditions exist in agriculture can and does foreclose all investigation by the commission as to what conditions do exist in agriculture, then it can declare any other set of conditions to exist and thereby foreclose investigation by the commission as to their existence. On this theory, Congress can make two lists including all the industries of the country, declare that depression prevails in those on one list and prosperity in those on the other list, and thereby oblige the commission to reduce the rates of the former list of industries and advance the rates of the latter, without any investigation whatever excepting to determine whether all the rates fixed by it will fall within what Mr. Hoch calls, "the zone of 'just and reasonable' rates." Mr. Hoch uses a word which shows what would be both the purpose and effect of such regulation. The commission, he says, should have followed "the mandate of Congress to readjust farm rates *in order to give them a preferential status.*" It is a well recognized principle that two rates may be within the zone of reasonableness, but that they may be "preferential," and therefore involve unfair discrimination, because one is relatively too high as compared with the other. The law, at least until the Hoch-Smith resolution was passed, prohibited the giving of such preference. Mr. Hoch says it was the very purpose of the Hoch-Smith resolution to cause preferential treatment of farm products.

This interpretation of the resolution by its principal author is a vindication of those who have claimed it was intended as a mandate by Congress to the commission to make rates differently from the way in which the commission always has believed they should be made and in disregard of common sense, economic principles and the law.

It is a defiance of common sense to assume that a mere dictum of Congress as to the conditions existing in one or more industries is sufficient to justify the basing of rates upon the assumption that the conditions mentioned by Congress do exist. Congress, because of its nature and functions, is incapable of making a thorough investigation and dependable findings as to the conditions in any industry. The principal purpose for which the Interstate Commerce Commission was created was to ascertain facts about the railroads and other industries, and with the information thus gathered as a basis, to apply sound economic principles in order that the rates made might be just and fair as between the railways that charge them and those who pay them. For Congress, without actual investigation, to declare that certain conditions exist, and require the commission to regulate rates accordingly, is to make the commission a mere automaton for giving effect to the uninformed and arbitrary will of Congress.

The economic unsoundness of the policy contemplated by the Hoch-Smith resolution, as interpreted by Mr. Hoch, becomes plain when it is considered that it would cause freight rates to be readjusted in accordance with the dictum of Congress as to the conditions existing in different industries, regardless of the causes of the conditions claimed by Congress to exist. Let us suppose as we believe to be a fact that such depression as has existed in agriculture has not been due in any measure to freight rates. The Hoch-Smith resolution as interpreted by Mr. Hoch, not only forbids the commission to determine whether there is or is not a depression in agriculture, but also forbids it to determine to what extent, if any, it is due to freight rates, and requires it, regardless of these matters, to make freight rates on farm products as low as it can while keeping them within the so-called "zone of 'just and reasonable' rates." There may be no agricultural depression at all, or, if one exists, it may be due to past speculation in farm lands, to high wages of organized labor resulting in high prices of commodities other than farm products, to high taxes or to any other cause or causes, but the commission, on Mr. Hoch's theory, is to seek a remedy for the condition alleged by Congress to exist in a reduction of "farm freights."

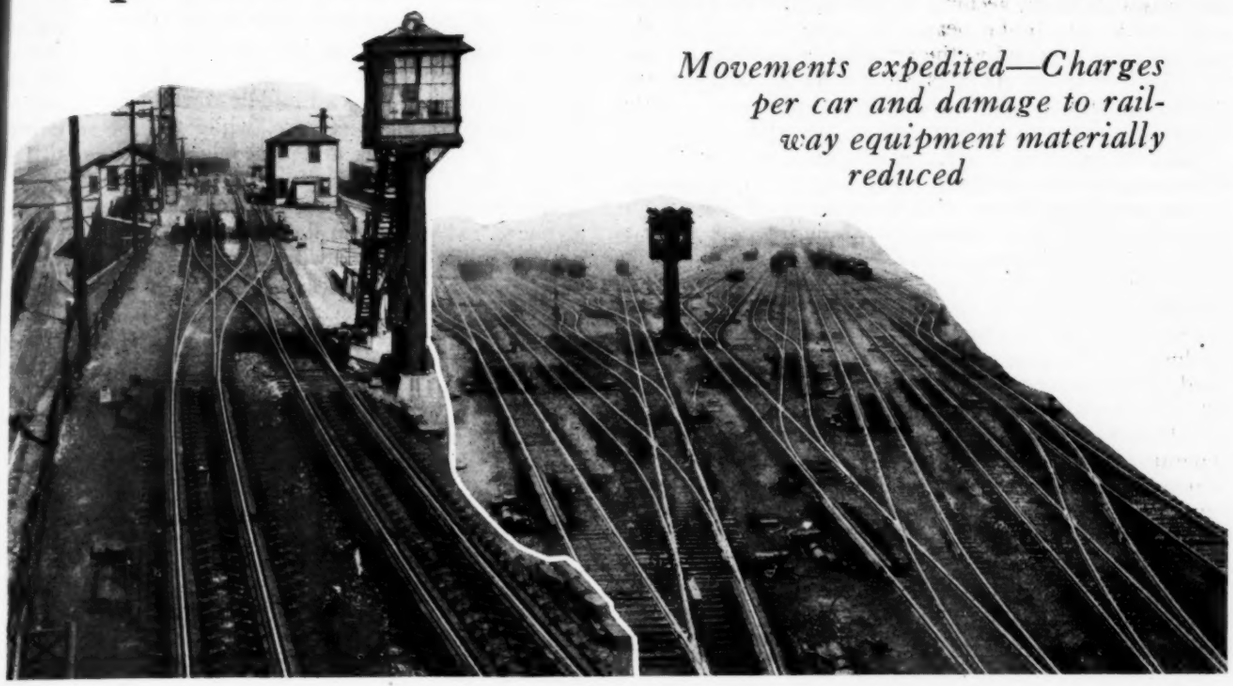
The Act to Regulate Commerce plainly requires rates to be made without unjust discrimination. It has always been understood that this means, among other things, that, in fixing rates, the commission must give great weight to the transportation costs incurred in handling different commodities and the value of the service rendered. But Mr. Hoch asks for "preferential" treatment of farm products, which plainly means that the rates on farm products should be made lower in proportion to the cost and value of transportation service than the rates on other commodities. This seems plainly contrary to the provisions of the Act to Regulate Commerce.

The courts hold that, to avoid unconstitutional confiscation, the railways must be allowed to earn a fair return. The Act to Regulate Commerce requires the commission, as the agent of Congress, to so adjust rates as to enable the railways to earn a fair return. If rates on farm products should be reduced and no compensating advances in rates on other commodities should simultaneously be made, the effect on many railways would be confiscatory. Simultaneous advances in rates on other commodities could hardly be made, however, without previous investigations and findings as to the commodities on which they should be made. Therefore, when Mr. Hoch contends, in effect, that the commission should have, without delay and investigation, reduced rates on farm products, in order to carry out the Hoch-Smith resolution, he contends that the commission should have made rates confiscatory. It is a good illustration of the state of mind into which the western agrarian politician can get himself that Mr. Hoch evidently believes that farmers should be given lower freight rates, regardless of the effect upon the railways. It has always heretofore been assumed, in both economic and legal discussions of regulation, that the economic necessities and lawful rights of the railways, as well as of the shippers, were to be considered.

It has remained for the principal author of the Hoch-Smith resolution to give an interpretation of it which is the most conclusive demonstration yet offered that it is, in intent and effect, an instruction by Congress to the commission to make rates without investigation, and that rates made in accordance with it would violate sound principles of economics and disregard the provisions of law against both unfair discrimination and confiscation. What better argument for the repeal of the resolution could be made?

# Car Retarders Reduce Cost of Yard Operation on Norfolk & Western

*Movements expedited—Charges per car and damage to railway equipment materially reduced*



*Looking east up the hump*

*Looking west down the classification track*

ON January 24, the Norfolk & Western placed in service an installation of electro-pneumatic car retarders in its newly rebuilt and enlarged westbound classification yard at Portsmouth, Ohio, which is already showing distinct operating advantages in spite of the fact that the business now passing through the yard is below normal, and that the employees are not yet thoroughly acquainted with the operation of all the new facilities. This improvement is evidenced by a comparison of the cost of yard operation, which shows a reduction of approximately 10 cents per car for March, 1928, as compared with March, 1927, after making an allowance of 12 cents per car for depreciation and interest on investment in the yard improvements. In addition, the damage to cars and lading in this yard has been reduced 40 per cent, and the movement of trains out of the yard is regulated better than before. Formerly, only 16 classifications were made in this yard, while with the new layout and facilities, 28 classifications are made, reducing the switching in other terminals such as Columbus, and Cincinnati.

### General Layout of Yard

This classification yard formerly consisted of 21 tracks, the longest of which held about 70 cars, the total capacity of the yard then being about 1,300 cars. This yard is used exclusively for the classification of coal originating on the Norfolk & Western in Virginia and West Virginia and destined for the lake ports and central western cities. This business has been increasing for several years until 1,600 to 1,800 cars were being handled daily in 1926. As this traffic was beyond the efficient capacity of the existing yard, it was decided to rebuild the entire layout and lengthen the tracks. In order to eliminate the necessity for car riders, it was decided at the same time to install a system of car retarders, power switch machines, and skates.

The new yard is designed to handle 4,000 cars a day over the hump. The classification yard consists of 37 tracks, 30 of which are for the classification of coal cars for forwarding in trains, 6 for bad order cars and 1 for cabooses. The track layout follows the multiple-ladder principle and in many cases pairs of tracks are grouped.

### Retarder Operates As Remote-Controlled Air Brake

The retarder system is the electro-pneumatic type manufactured and installed by the Union Switch & Signal Company. The 34 retarders are located as shown

**The Retarder Operator Has a Loud Speaker and the Car List Located Conveniently**

in the track diagram. Each retarder unit, electrically controlled from the towers, is actuated by an air cylinder, the outward motion of the piston providing the necessary braking force. Brake shoes are bolted to cast steel beams, which in turn, are pinned to the trunnions, and through them, secured to the ties. This construction allows the brake beams to move to or from the rail as air is supplied to the retarder or exhausted from it. The retarder operates simply as a remotely-controlled air brake. Four pressures may be set up in the retarder cylinder at the option of the operator.

The trunnion springs, which cushion the initial shock as a car enters the retarder, are so set, in relation to ties and brake beams, that the number of cross members is reduced to a minimum and the inter-tie space is left clear for tamping ties. The use of volute springs gives an added advantage, in that they are practically immune to damage by dragging equipment. A new manganese steel brake shoe, now proposed, will materially reduce maintenance while its weight will be decreased and, at the same time, its life, and the braking force it is capable of exerting, will be increased.

The crossover and classification track switches are operated by direct-acting electro-pneumatic switch machines, so arranged that, if trailed through when in the wrong position, the switch will reset itself without damage. Circuit controllers have been placed on the switch movements to repeat the normal or reverse position of the switch points; a color-light signal at each switch, showing in two directions, serves the purpose of a switch-target.

Power-operated skates are located about 100 ft. beyond the last frog on each track, except where the frog is on a curve, when they are placed at the beginning of the straight track beyond. A skate machine consists of an air cylinder with a system of levers, controlled electrically from the towers, which places the skate on the rail.

### Control From Two Towers

The towers are of steel construction and are accessible from the ground by stairways. They are glass-enclosed on all sides in order to give the operator a clear and unobstructed view of the territory under his control.

Tower 1, just below the apex of the hump, controls the throat of the yard; Tower 2, nearly in the center and containing two machines, controls the entire lower part. The machines in Tower 2 have been placed one on the right and one on the left side of the tower and are operated by two men, so that this tower actually performs the functions of two. The table gives the functions under the control of the various machines.

**Functions Under the Control of Each Machine**

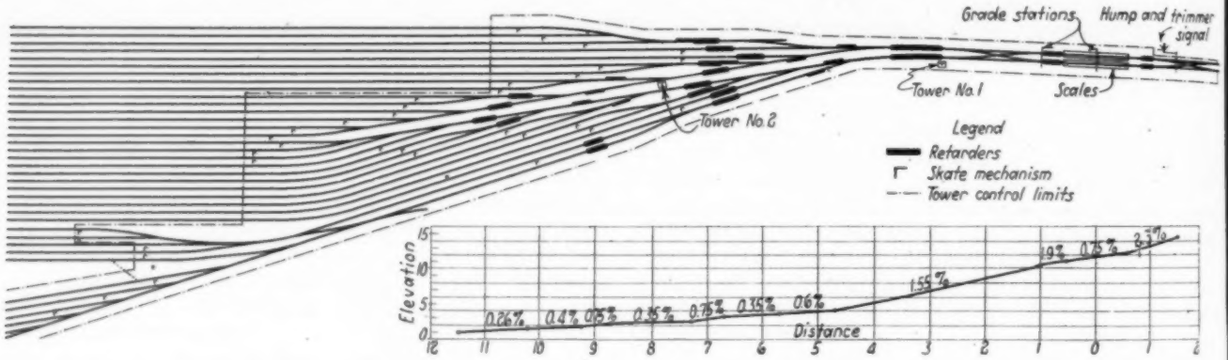
| Machine | Retarders | Switches | Skates |
|---|---|---|---|
| 1 | 12 | 9 | 0 |
| 2 | 11 | 23 | 22 |
| 3 | 11 | 12 | 15 |
| | 34 | 44 | 37 |

The control machines, except for the machine in Tower 1 which does not have any skate control levers, consist of four rows of control levers, mounted on a sloping panel. The two middle rows of levers are for the control of the retarders, while the levers for the control of the skates are placed in the top row. The bottom row of levers is for the control of the power-operated switches. Directly above the switch levers is a row of red and green lights to repeat the normal and reverse indications of switches.

A large saving has resulted from the elimination of the car riders and switch tenders. The storage and classification capacity of the yard has been increased by the car rider track while the operating and maintenance costs of the rider car have been eliminated entirely. The reduction of forces has also reduced the possibility of personal injury, which was previously an important item.

### Power Equipment and Other Facilities

The railroad company's power plant, located at the shops adjacent to the yard, which furnishes compressed air for the large shop, also supplies the compressed air for the operation of the retarders, switches and skates. The battery equipment consists of two sets of 6 cells each of 100-a.h. Exide storage batteries. These batteries are charged through Union copper-oxide rectifiers.




**General Track Plan Showing Location of Retarders and Grades of the Hump**

Loud speaker telephones have been installed for communication from the yard-master's office to the towers and between the towers. By this means the towermen may communicate without leaving the control panels, and changes in conditions in the yard, in the switching list or changes of destination may be given to them easily and with little loss of time.

Position-light signals govern the hump and trimmer movements. The indication "hump fast" is given when the lights are vertical; when the lights are at 45 deg. in the right-hand quadrant, the indication is "hump slow"; the lights horizontal indicate "stop"; and at 45 deg. left-hand quadrant, "back-up." The trimmer signal, facing toward the classification yard, is mounted on the same mast as the hump signal. This gives two indications, "trim" when the lights are vertical and "stop" when horizontal. The control levers for both of these

signals are located at the top of the hump and are handled by the yard conductor.

The yard is lighted by floodlights mounted in batteries on steel towers. Additional floodlights are mounted on the top of the retarder towers to give increased illumination at points where needed by the retarder operator.

### Cost of Yard Operation Reduced

Decided advantages of the new layout are already evident. As previously stated, a comparison of the principal items of the cost of yard operation for each car classified shows a good reduction in March, 1928, over March, 1927, although it is too early to arrive at precise conclusions.

The saving in wages is considerable after deducting the wages of the new car retarder maintainers and helpers, a maintainer and two helpers being employed on the day trick and a maintainer on each of the other two tricks.

### Was Operated With Two Tricks

In March, 1927, the yard was operated with two tricks, 6:30 a.m. to 2:30 p.m., and 6:30 p.m. to 2:30 a.m. The average number of riders per shift was 24.5. Each rider worked an average of 2 hr. 45 min. overtime every day. The motor car operator (each trick) who formerly hauled the riders back to the hump is no longer required. The power-operated switches likewise relieved the four switch-tenders on each trick.

Mallet type locomotives equipped with boosters or auxiliary locomotives under the tender, are used to push full trains of 100 to 110 cars, 9,000 tons, over the hump. This engine has a drawbar pull of 143,800 lb. at speeds of 3 to 5 miles an hour.

During a great portion of the month of March, 1928, the hump engine was the only locomotive used in the westbound yard, the west end engine and the trimmer engine formerly used not being required. The hump engine now has time to double trains together and put on the caboose.

This switching was formerly done by the west end engine.

### Number of Employees Reduced

With the car retarder operation, the number of employees has been so reduced, as compared with car riders and switchman operation, that it is now economical to operate the yard for three instead of two tricks.

The three-trick operation has the advantage that trains can be made up at any time and can depart at regular intervals throughout a 24-hour period, which results in smoother operation of the adjoining divisions and likewise results in the elimination of congestion on the road.

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THE CHICAGO, ROCK ISLAND & PACIFIC has reduced the schedule of its Mid-Continent special which operates between Dallas, Tex., and Minneapolis, Minn., and its "Firefly" which operates between Dallas and Kansas City, Mo., by 45 minutes. Under the new schedule the Mid-Continent leaves Dallas at 9:15 p. m. instead of 8:30 p. m. and arrives in Minneapolis at 8 a. m. as previously. The return schedule has been reduced five minutes. The Firefly leaves Dallas at 10:45 a. m. instead of 10:00 a. m. and arrives in Kansas City at 7:10 a. m. as previously. Returning it leaves Kansas City at 8:10 p. m. instead of 8:00 p. m. and arrives in Dallas at 3:30 p. m. instead of 3.35 p. m.

# I. C. C. Declines to Suspend Lake Cargo Coal Rates

WASHINGTON, D. C.

ITS own efforts to prevent a rate war among the railroads over the relative adjustment of "lake cargo" coal rates having been prevented by a court injunction, restraining enforcement of its order directing the southern roads to cancel their reduction in rates from the southern district mines, the Interstate Commerce Commission apparently has decided to let the railroads fight the matter out among themselves until they are able to reach some kind of a compromise.

On June 12 the commission declined to suspend tariffs filed by the Baltimore & Ohio, Buffalo, Rochester & Pittsburgh, New York Central, Pennsylvania, Pittsburgh & Lake Erie, Western Maryland and F. V. Davis, agent, providing for a reduction of 20 cents a ton, in the rates from mines in Ohio, Pennsylvania and northern West Virginia on coal to Lake Erie ports for transshipment by water as cargo for discharge at lake ports north of Port Huron, Mich., and Sarina, Ont. This reduction, which the roads propose to make effective on June 18, to expire by limitation on December 31, (except those via or in connection with the Baltimore & Ohio) corresponds to the reduction recently put into effect by the roads serving the southern coal district, which in turn met the reduction ordered by the commission effective last August in the rates from the northern district.

When the southern roads proposed to meet the reduction ordered by the commission, in order to restore the differential relation which had formerly existed but which it had tried to change, the commission suspended the tariffs and, after hearings, ordered them cancelled. Southern coal operators then obtained an injunction against the commission's order from the federal court at Charleston, W. Va., and the case is on its way to the Supreme Court. Several meetings were held by the railway executives and tariff officers in an effort to bring about a compromise, possibly on a 35-cent differential, but no agreement was reached and the northern lines filed their tariffs about a month ago.

The reduction in the northern rates ordered by the commission in 1927, after the rates had been before it in various earlier cases, increased the differential under the rates from West Virginia and Kentucky from 25 to 45 cents. The southern reduction restored the 25-cent spread and the latest reduction puts the difference between the rates from the competing districts back to 54 cents, but some hints of a farther reduction have been thrown out by the southern roads.

Protests asking the commission to exercise its power to suspend the new northern rates had been filed by a committee representing the southern coal operators, by the Chesapeake & Ohio and Louisville & Nashville railroads, by the city of Detroit, and by the Corporation Commission of Virginia. A reply to the protest of the southern operators has also been filed by the Pittsburgh Operators' Lake Rate Committee.

The action of the northern lines is described in the protest of the southern operators as "obviously retaliatory" and intended to "initiate a rate war." The L. & N. protest also charges that the action of the northern railroads "is intended to start a rate war with the L. &. N., C. & O., and N. & W. for the purpose of increasing the differential against the southern West Virginia and Eastern Kentucky coal mines and in favor of the Pittsburgh district from 25 to 45 cents a ton and

depriving the said mines and the carriers serving them of the great bulk of their lake cargo coal tonnage." "Furthermore," it says, "if said proposed reduced rates become effective, they will cause a rate war unless the C. & O., L. & N., and N. & W. abandon their legal rights and submit to the gross injustice of being deprived of most, or a substantial part, of their lake cargo coal traffic. And, it is self-evident that if these carriers can and do meet the reductions of their northern competitors, and if the latter maintain the position proclaimed in the aforementioned tariffs, lake cargo coal rates will corkscrew downward until all of them become less than the cost of carriage."

The L. & N. also asserts that if the reduced rates are allowed to go into effect the result will be a loss of approximately 3,800,000 tons of lake cargo coal traffic to it and its connections, which, at the former rate of $1.91 a ton would produce a revenue of $7,258,000 and at the present rate of $1.71 would produce $6,498,000, and at a rate of $1.51 a ton, which would be the rate from the southern fields if the southern roads should attempt to meet the latest reduction of the northern lines, $5,738,000 per annum. It adds that the C. & O. and Norfolk & Western would suffer a corresponding enormous loss of tonnage and revenue.

After referring to the commission's power to prescribe minimum rates to prevent rate wars the L. & N. says that the northern lines as well as the southern lines should be made to await the decision in the case now pending in the court as to whether the provisions of section 15a justified its suspension of the reduction by the southern lines.

The southern operators say that the new tariffs of the northern lines "either provide for a legalized rebate (refund of 20 cents per ton if the coal is unloaded at points 'north' of Port Huron, Mich., and Sarina, Ont.) on certain shipments of lake cargo coal or else they provide two different rates for the same transportation service." "The published rates on all shipments of lake cargo coal are left unchanged", they say, "but the footnote appearing in the tariffs provides for a refund of 20 cents, dependent upon contingencies happening after the transportation service performed by the railroads has been completed and after the coal has passed into the possession of carriers by water, beyond the control of the railroads or of this commission, and beyond the possibility of any adequate policing by the commission or the railroads." They also assert that the plan of the northern lines is "an endeavor to thwart or circumvent the decree of the United States district court" and that "they should not now receive aid and comfort from the commission in defeating the decree of the court pending appeal to the Supreme Court of the United States."

The Chesapeake & Ohio, in its protest, asks the suspension of the tariffs on the ground, among others, that the proposed rates create a prima facie presumption that they are too low and therefore in violation of section 1. It asks that it and its shippers may receive from the commission the same consideration in connection with the proposed reductions that the northern carriers and their shippers received in connection with the proposed reductions of the sourthern lines last August. The Pittsburgh district committee takes the position that the rates should be permitted to become effective because they establish the relationship between the northern and southern rates which the commission indicated to be proper in its second decision in the lake cargo case. It contends that the action of the northern lines is not violative of the injunction of the court, which runs against the order of the commission which ordered the cancellation of the reduced rates from the southern fields. Answering the contentions of some of the protestants that the action of the northern lines initiates a rate war, the Pittsburgh operators say that the rate war was in fact initiated by the southern lines when they filed the reduced rates last summer which the commission ordered cancelled.

# Freight Car Loading

WASHINGTON, D. C.

OBSERVANCE of the Memorial Day holiday brought revenue freight car loading down in the week ended June 2 to 934,214 cars, as compared with 1,020,916 cars in the preceding week, a decrease of 86,702. The total for the week, however, represented an increase of 22,704 cars as compared with loading in the corresponding week of last year and a decrease of 10,650 cars as compared with 1926. Loading of miscellaneous freight amounted to 371,128 cars, an increase of 24,870 cars as compared with a year ago. Loading of less-than-carload merchandise and ore also was larger than in corresponding week of last year. Coal loading of 138,941 cars was only 463 cars under last year's total. Loading in all districts, with the exception of the Pocahontas, was larger than a year ago. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

**Revenue Freight Car Loading**

Week Ended Saturday, June 2, 1928

| Districts | 1928 | 1927 | 1926 |
|---|---|---|---|
| Eastern | 214,175 | 204,568 | 218,107 |
| Allegheny | 189,665 | 187,216 | 191,328 |
| Pocahontas | 49,088 | 55,878 | 54,969 |
| Southern | 138,650 | 135,918 | 140,391 |
| Northwestern | 148,376 | 145,484 | 147,292 |
| Central Western | 124,554 | 117,674 | 124,824 |
| Southwestern | 69,706 | 64,772 | 67,953 |
| Total Western Districts | 342,636 | 327,930 | 340,069 |
| Total All Roads | 934,214 | 911,510 | 944,864 |
| Commodities | | | |
| Grain and Grain Products | 33,914 | 36,415 | 36,836 |
| Live Stock | 24,885 | 28,694 | 25,559 |
| Coal | 138,941 | 139,404 | 154,550 |
| Coke | 9,864 | 10,413 | 11,548 |
| Forest Products | 64,401 | 64,512 | 70,860 |
| Ore | 60,890 | 58,835 | 62,544 |
| Merchandise L.C.L. | 230,191 | 226,979 | 234,455 |
| Miscellaneous | 371,128 | 346,258 | 348,512 |
| June 2 | 934,214 | 911,510 | 944,864 |
| May 26 | 1,020,916 | 1,026,789 | 1,080,786 |
| May 19 | 1,003,497 | 1,027,498 | 1,039,070 |
| May 12 | 1,001,983 | 1,029,424 | 1,029,748 |
| May 5 | 979,662 | 1,024,761 | 996,216 |
| Cumulative total, 22 weeks | 20,468,015 | 21,436,696 | 21,123,115 |

The freight car surplus for the period ended May 31 averaged 304,152 cars, including 108,833 coal cars and 143,264 box cars.

## Canadian Car Loadings

Revenue car loadings at stations in Canada for the week ended June 2 totalled 69,075 cars, an increase over the previous week of 7,009 cars and an increase over the same week last year of 6,989 cars.

| | Total Cars Loaded | Total Cars Rec'd from Connections |
|---|---|---|
| Totals for Canada | | |
| June 2, 1928 | 69,075 | 37,112 |
| May 26, 1928 | 62,066 | 38,992 |
| May 19, 1928 | 68,993 | 41,287 |
| June 14, 1927 | 62,086 | 34,580 |
| Cumulative Totals for Canada | | |
| June 2, 1928 | 1,393,463 | 880,472 |
| June 4, 1927 | 1,326,584 | 857,087 |
| June 5, 1926 | 1,238,522 | 822,560 |

DURING the period from May 1 to 15, 1,880 passenger trains on the Wabash had an "on-time" record of 99.68 per cent. The Decatur and Moberly divisions, operating 1,014 trains, had a record of 100 per cent during that time. Of the seven divisions, six reported a performance of better than 99 per cent.

# Locomotive Designs to Reduce Maintenance*

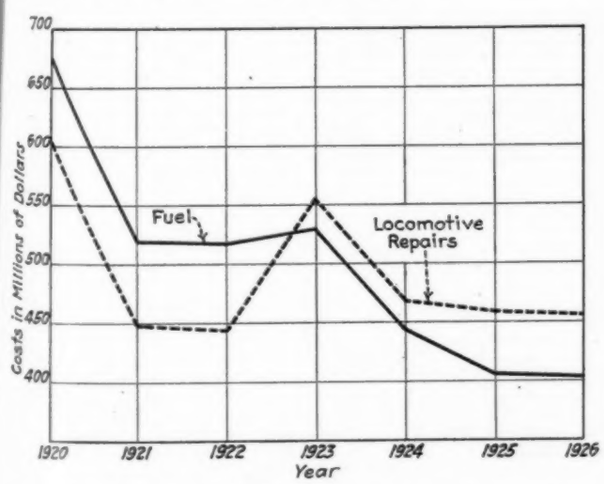
*Taking advantage of the tandem main rod drive to reduce cylinder centers—Substituting a unit casting for front frames and cylinders*

By W. E. Woodard
Vice-president, Lima Locomotive Works, Inc.

IT seems fair to assume that the new power purchased and new locomotive specifications prepared during the past two years indicate the trend of locomotive construction—even though the amount of new power represented is relatively small. Judged by this standard, there is not the slightest question about the railways endorsing the principles of low combustion rates, higher boiler pressure, limited cut-off, and booster.

To this association is due much of the credit for the magnificent showing in fuel economy made by the railroads in the last few years. How much more it is possible to accomplish may be realized from this fact: The locomotives possessing all of the features just enumerated represent less than five per cent of the freight power of the country. There are, therefore, plenty of opportunities yet open to reduce the total coal bill of the railroads by the purchase of modern power units.

Advances are almost always initiated as the result of comparisons. One result of the splendid reduction in total locomotive fuel consumption already made is that by comparison attention is forcibly called to another large item of operating expense which has now actually become greater than fuel costs; that is, locomotive maintenance. Although maintenance has been reduced, it has not fallen as rapidly as fuel costs, and now locomotive maintenance is really taking a greater proportion of operating expenses than is coal.




**Trend in the Cost of Locomotive Fuel and Locomotive Repairs—Class I Railways**

## Maintenance Now Costs More Than Fuel

And thus it appears reasonable that the locomotive designer in planning future developments should consider changes in mechanical construction of the locomotive which promise substantial improvements in the maintenance item. And these should be undertaken and go hand in hand with any further advances directed to betterment in fuel performance.

I do not want to imply that locomotive designers have ignored the maintenance problem. But I think it is a fair statement to say that fuel economy and increased power have received the major effort and that no change in fundamental design has recently been made which is especially directed toward reducing locomotive maintenance. In my opinion, one of the most important possibilities in future locomotive design lies in this direction, particularly as greater reliability and longer life of the machinery directly aid in the long-run program and more intensive utilization of power, which in turn will result in greater fuel economy.

## The Two Divisions of Locomotive Maintenance

There are naturally two major divisions in locomotive maintenance: The maintenance of the steam generating plant and the maintenance of the steam-using plant. The division of the cost of maintenance between these two general items appears to be roughly about one-third boiler and two-thirds machinery.

The solution of the boiler problem probably lies in some form of water-tube firebox, which will eliminate staybolts and upon this problem much work is being done, although as yet there are comparatively few such boilers in service.

Improvements in the machinery portion offer possibilities which can be used at once. Moreover, machinery improvements offer the greatest chance for reducing maintenance costs by attacking the major portion of this expense. These improvements can be made without going to any untried elements of construction. The various designs which I will show have been developed for the purpose of reducing machinery maintenance, and they not only offer possibilities in this direction, but also provide means within our present width limits for increases in power and size beyond the range possible with present construction.

## The Problem of Cylinder Centers and Frame Centers

In the design of the machinery of a locomotive two fundamental dimensions receive, or at least should receive, major consideration. These two dimensions (commonly called frame centers and cylinder centers), together with the piston thrust or load which is set by the size of cylinder and steam pressure, determine the major stresses which come upon the machinery portion of the locomotive.

As locomotives have increased in size and power, the distance between frame centers has steadily decreased while cylinder centers have, on the other hand, spread

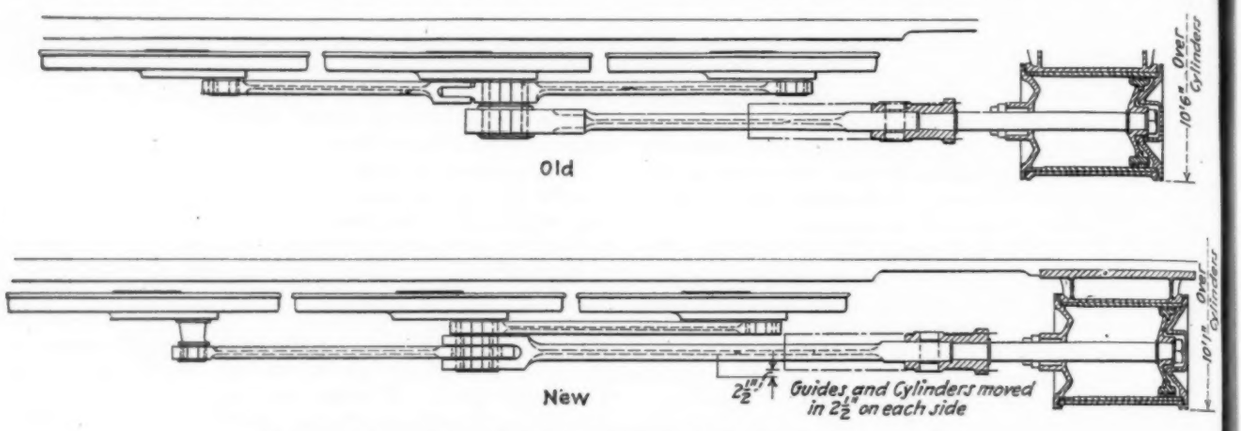
* Abstract of a paper presented at the convention of the International Railway Fuel Association at Chicago, May 10, 1928

out, resulting in greatly increased leverage or bending moment about the frames. As a result, bending moments on frames, axles, and pins, as well as bearing pressures on all journals, have increased in magnitude until now they are many times those existing on locomotives built only a few years ago. No presentation of figures is needed to prove this point. Anyone who rides locomotives of great power has felt the working of these enormous forces upon the locomotive structure.

The suggestions I present attack this fundamental problem by offering a way to decrease these stresses materially by reducing the distance between cylinder centers. They also provide a more substantial connection between the cylinders and the main frames, as well as a rigid unitary support for the guides and valve motion. All three of these elements of design are vital to the maintenance problem.

The drawing of the tandem main rod drive shows the steps by which the new designs were evolved. The guides are moved slightly ahead of their ordinary position, so as entirely to clear the pin and rod on number one driving wheel, thus allowing the cross-centers of the guides and cylinders to be pulled inwardly. The main rod is connected to the second driving wheel and, on account of using the tandem main rod drive, the force required to turn the back drivers is transmitted directly to them without going through the main pin, as is the case with the ordinary arrangement. This leaves the main pin with only one driver to turn, thus making it possible to cut down the length of this bearing. This new arrangement makes possible the building of the heaviest type of locomotive with only 88-in. cylinder centers, a decrease of 5 in. to 7 in. over recent large locomotives. This means a reduction of the bending moment on the frames, axles, and pins of as much as one sixth, which is a significant decrease in view of the magnitude of these forces.

The drawing of the tandem main rod drive shows the

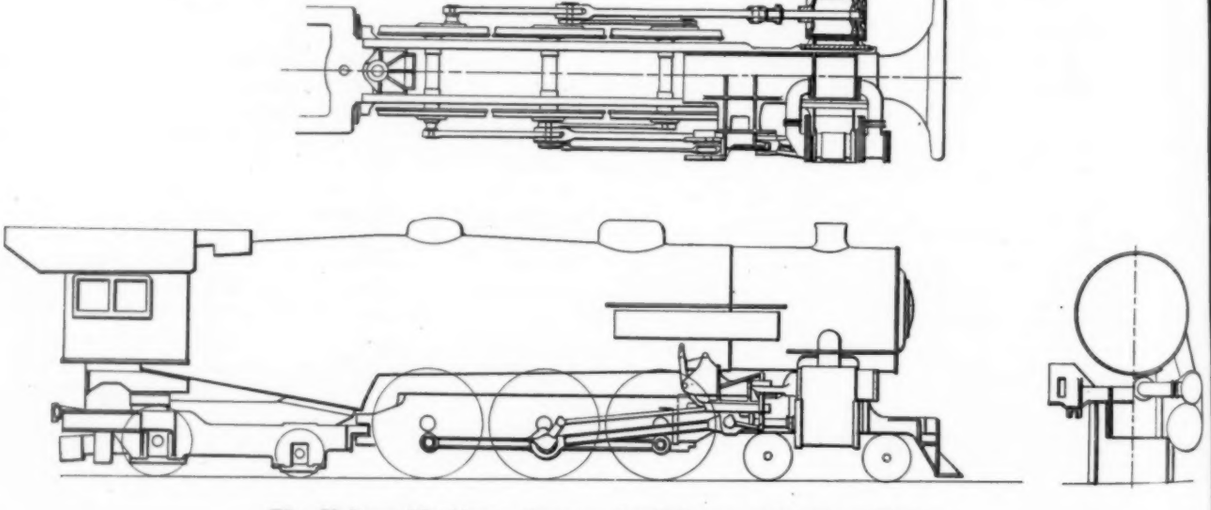



**The Tandem Main-rod Drive Compared with the Conventional Type**

effect of the arrangement in the overall width of the cylinders. The relief afforded in this one item alone is at once apparent to the mechanical officers who have for years been trying to squeeze their locomotives inside hard and fast width limits.

Another advantage which follows is the possibility of using standard cross-cylinder centers for all sizes, thus securing a far greater interchangeability of parts than is possible when cylinder centers change with different design.

Still another very important point in this arrangement is the manner in which it lends itself to a construction involving a unitary engine machinery support. This single casting incorporates the cylinder saddles, bumper bracket, deck casting, and front frame filling, together



**The Unitary Machinery Support Applied to a 4-6-4 Type Design**

with integral valve gear and guide supports. It provides an unusually fine bolting connection to the main frames ahead of the first driver and is also bolted to the smoke-box at the saddle in the usual way.

One of the drawings of the unitary machinery support shows the application of these principles to a 4-6-4 type locomotive. It clearly shows how the arrangement provides for a rigid integral support for the guides and the valve motion. It hardly needs any discussion in detail to show the desirability of a solid support for the guides which will insure against any bending or distortion. While the design shows a single-bar type of guide, such, for example, as used on the Pennsylvania heavy power, there is ample space in the design to provide an equally rigid support for the ordinary alligator type of crosshead and guide. In the application to this class of power a reduction in cylinder centers of about 5 in. or 6 in. will be secured, bending moments reduced about one sixth, and the main boxes relieved of more than one half their usual work. Please note also the very fine connection between the unitary machinery support and the main frames.

With the 4-8-4 type locomotive, cylinder centers of 94 in. or 95 in. are required with the ordinary construction. With the arrangement of this type shown in one of the illustrations, cylinder centers of 88 in. can be secured, thus reducing this dimension by 6 in. or 7 in. The same kind of support for guides and valve motion is afforded as before described for the 4-6-4 design.

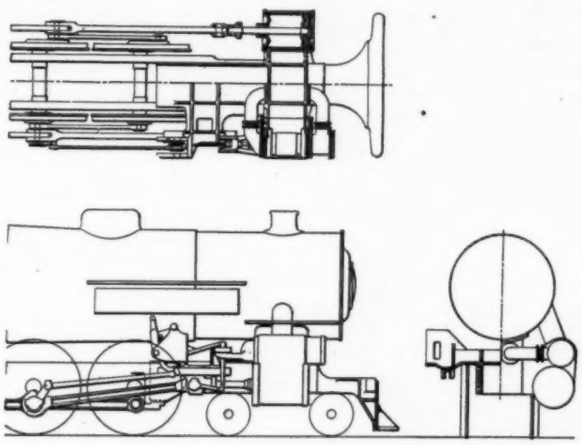
In any of these designs, the cylinders may be cast integral. Such an arrangement is illustrated in a drawing which also shows in a little more detail the integral valve motion support and guide supports, as well as the connection between the unitary machinery support casting and the main frames.

### The Same Principles Adapted to the Two-Wheel Leading Truck

The use of this principle is not confined to locomotives having a four-wheel leading truck. A very satisfactory application has been worked out for a two-wheel leading-truck locomotive and this is shown applied to a locomotive having six pairs of coupled drivers, although it is equally applicable to engines having a lesser number of driving wheels.

It would be entirely impracticable to build such a locomotive as this with the ordinary design of cylinders, rods, pins, and axles, as cylinder centers would have to be placed 96 in. or 98 in. apart, with a corresponding heavy bending moment on the main axles, crank pins, and other parts. The cylinder centers on the design shown are 88 in., a decrease of 10 in. from the distance required with the ordinary form of construction were it physically possible to apply it.

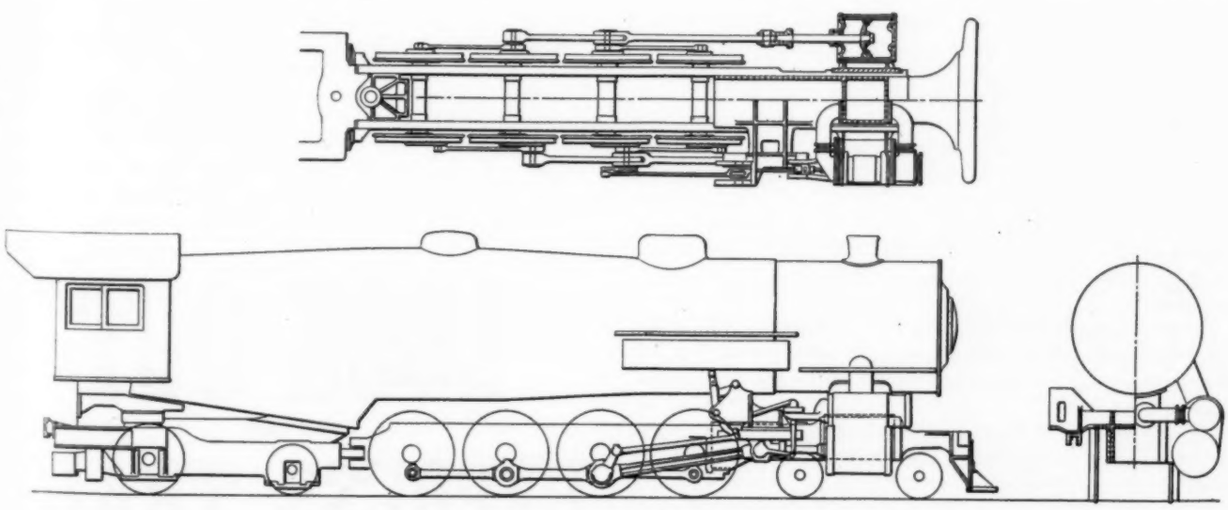
This design is in the range of locomotive sizes where the Mallet has been the only unit which the designer could offer. The new design, therefore, shows the possibilities in a field of motive power where maintenance



**The Machinery Support with the Cylinders Cast Integral**

costs have always been high and where a design which promises a reduction in this item of expense is well worth consideration.

The six-wheel trailing truck is shown in the design for the reason that it is necessary to have a firebox of very large size to produce steam economically for the large cylinders. In the design presented a firebox with 151 sq. ft. of grate area is contemplated. There will be nothing revolutionary or troublesome in a six-wheel articulated truck, as the practicability and safety of four-wheel truck designs have been proved by their use on about



**Application of the Tandem Main-rod Drive and the Unitary Machinery Support to an Eight-coupled Locomotive**

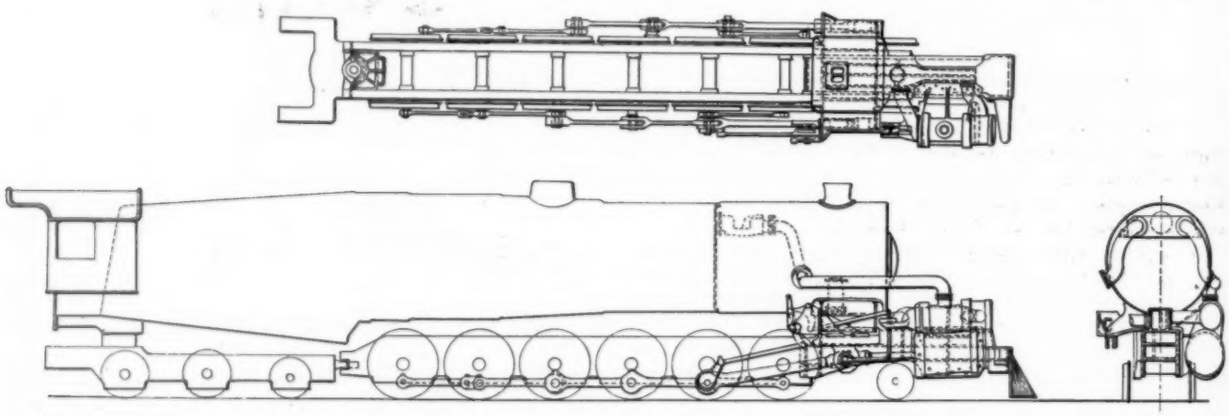
200 locomotives operating in a wide range of service.

The possibilities of this design can best be understood by a comparison with a typical heavy simple Mallet of about equal driving wheel weight, shown in the table.

**Comparison of a 2-12-6 and a 2-8-8-2 Simple Mallet Locomotive**

| | 2-12-6 | 2-8-8-2 |
|---|---|---|
| Tractive force, total | 130,000 lb. | 130,000 lb. |
| Cylinders | 2—32 in. by 32 in. | 4—28 in. by 32 in. |
| Driving wheel diameter | 63 in. | 63 in. |
| Total weight of locomotive | 600,000 lb. | 600,000 lb. |
| Boiler capacity, lb. steam per hour | 99,600 lb. | 80,000 lb. |
| Increase in boiler capacity, per cent | 24½ | .... |

Although the two engines each weigh approximately 600,000 lb., the 2-12-6 design has a 24½ per cent increase in boiler capacity, which is readily accounted for by the omission of one pair of cylinders, guides, rods, etc., and two pairs of driving wheels. The real measure of usefulness of the locomotive is boiler capacity; it is the factor which determines what the gross ton-mile output will be. As far as the construction details are concerned, the bending moments in the 2-12-6 are actually within the limits of several existing locomotive designs and, while some of the features may appear to contain innovations, as a matter of fact, there is nothing in the elements of this design which have not a sound basis either in development already done or by comparison with existing practice.



**A Single Driving-unit Design, Possible with the Tandem Main-rod Drive, Embodying an Adaptation of the Unitary Machinery Support for Two-wheel Engine Trucks**

### How Will Maintenance Be Reduced?

Now, what improvements could be expected if these suggestions were incorporated in a locomotive?

It is at once apparent that a material decrease in width over the cylinders would be secured. Or, within a given width limit, a considerably more powerful locomotive can be built.

There would be a substantial decrease in the maintenance of the driving boxes, rod bearings, and other parts over engines constructed with the conventional cylinder arrangement and rods. This statement can be made with certainty, for the reason that there are now available comparisons between tandem main rod drives and the ordinary rod drives operating under similar conditions and with the same cylinder cross-centers. These comparisons show a decided improvement with the tandem main rod construction in maintenance of both the rods and the driving boxes.

It is evident that a very much more substantial connection between the cylinders and the frames can be secured, as there is a much larger space available for bolting.

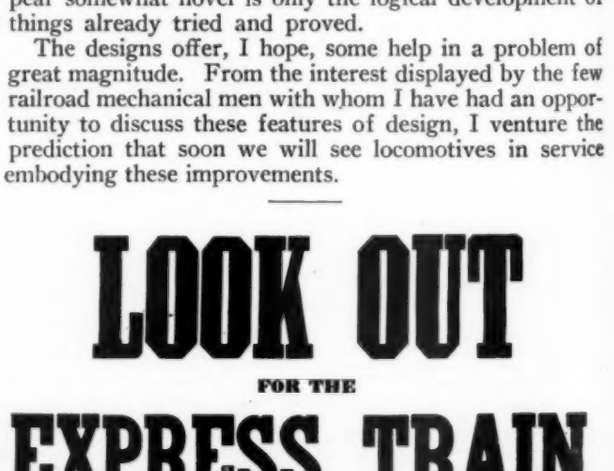
Based upon the experience with existing tandem main rod drives, mentioned above, it can be predicted with certainty that the racking of the frames and frame connections would be much reduced.

Counterbalance conditions would be much improved, on account of the decreased offset between the planes of movement of reciprocating parts and the balance blocks.

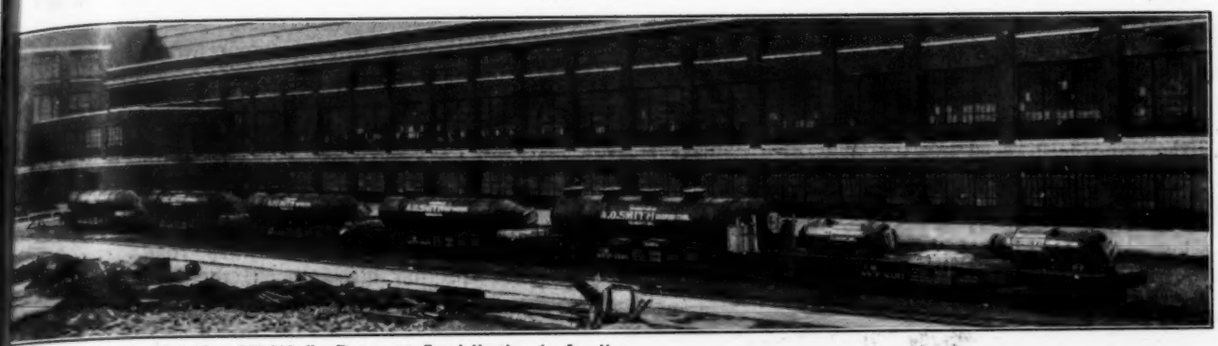
There would appear to be little argument that supporting the guides and valve motion on an integral casting, which is either cast together with the cylinder barrels or directly connected to them, would result in a marked improvement in the upkeep of the guides and valve motion. Moreover, there is ample space to make this casting very rigid, thus insuring the permanent alinement of these parts relative to each other and to the cylinders.

While these suggestions apply particularly to locomotives of great power, the principles are useful in any designs and sizes. The various points have been presented in outline only. But if you will take the designs shown and analyze them you will find that each step has a firm foundation in existing practice and what may appear somewhat novel is only the logical development of things already tried and proved.

The designs offer, I hope, some help in a problem of great magnitude. From the interest displayed by the few railroad mechanical men with whom I have had an opportunity to discuss these features of design, I venture the prediction that soon we will see locomotives in service embodying these improvements.




**An Old Sign Intended to Preserve the Well-Being of New Englanders—Similar Signs Were Posted at All Stations on the New York & New Haven in 1850**



Oil Refining Vessels Weighing 500,000 lb. Represent Specialization in Loading

# Attendance at Claim Meeting Exceeds Previous Years

*New theories concerning the cause of damage to lading while in transit are being investigated*

MARKED progress in scientific investigations of the relation of container construction, loading and stowing methods, the condition of the roadbed and the design of car springs, draft gears and other accessories to damaged lading was indicated at the thirty-seventh annual meeting of the Freight Claim Division of the American Railway Association held at Detroit, Mich., on June 5 to 8. The attendance at this meeting was greater than in any previous year, the number of representatives of railroads present being 350.

In addition to the consideration of the reports of the several committees, addresses were made by R. H. Aishton, president of the A. R. A. and R. B. White, president of the Central of New Jersey; Julius H. Parmelee, director of the Bureau of Railway Economics spoke on "The Value of Statistics in the Study of the Loss and Damage Problem," and Frank Wenter, Jr., general claim agent of the Chicago & North Western addressed the meeting on "Practical Accident Prevention." At a joint luncheon of the Detroit Board of Commerce, the Detroit District Shippers Conference, the Detroit Terminal Committee of the Chicago Claim Conference and the Division, L. G. Macomber, traffic commissioner of the Detroit Board of Commerce spoke on "The Value of Co-operative Work Between Carriers and Commercial Organizations," and Thomas C. Smith, chairman of the Freight Claim Division described the work of the Division and its relation to the shipper.

Officers elected for the ensuing year were: Chairman, H. T. Lively, general claim agent of the Louisville & Nashville, Louisville, Ky.; first vice-chairman, John D. Shields, freight claim agent of the Chicago, Burlington & Quincy, Chicago; and second vice-chairman, A. R. McNitt, freight claim agent of the Union Pacific, Omaha, Neb. Washington was chosen as the place for the 1929 annual session.

### Committee on Freight Claim Prevention

The committee on Freight Claim Prevention reported that notwithstanding a downward trend of loss and damage for a period of seven years, the account for 1927 shows an increase of $525,744 or from $38,187,315 in 1926 to $38,713,059 in 1927. The number of claims presented shows a slight increase, while the number of claims under investigation and the amount of paid claims in suspense continues to decrease, thereby reflecting a healthy condition in the claim situation as a whole.

The unlocated damage and rough handling items, in 1927, show an increase of more than a million dollars. In other words, while the total of the account for 1927 is less than for 1925, during the two-year period there has been an increase in these two causes of $2,253,825. This feature doubly emphasizes the repeated statements of the committee since 1921 that, in order to enable prevention activities to be intelligently applied and a substantial reduction made in this outstanding item of unlocated damage and rough handling, there must be a careful analysis and a more definite allocation of payments.

The committee felt that although all damage is not chargeable to rough handling, there is rough handling among the carriers and that the problem should be viewed, not from the angle of what the other fellow should do, but with a determination to correct conditions as they develop. Based on evidence secured from hundreds of tests with impact recording devices, it can be safely assumed that fully 95 per cent of the known rough handling occurs in yard and terminal switching, and further developments indicate clearly that on lines making a close study of the matter, it is known just what yards or terminals are the offenders. The commodities involved most frequently include fresh fruits and vegetables, sewer pipe, live stock, automobiles, furniture, eggs, glass, glassware and crockery.

The committee believes that shippers and receivers of freight can be of great help in the program for controlling these carload damage items. Fully 75 per cent of the carload traffic is loaded by the shipper and unloaded by the consignee. There is every indication of a willingness on the part of the shipping public to take an active part in the educational program, if a plan can be devised for furnishing the shippers with information in connection with cars improperly loaded. If shippers whose carload consignments are frequently damaged could be acquainted with the methods employed by shippers whose loading is generally satisfactory, much improvement might be effected.

During 1927 there was a net increase of $914,025 in the fresh fruit and vegetable account. The fact that this is nearly double the total increase in the entire loss and damage bill is sufficient to cause much concern, but further consideration shows that unlocated damage and rough handling increased $962,541. Of the 16 classified causes for charges to this account, unlocated damage and rough handling are the only ones showing a need of serious attention and, in summing up the things responsible for the abnormal charges to these two items, it

**Pears Damaged in Transit**

is recognized that "broken packages" is the one big problem.

While the correction of this cause depends largely upon improved containers and methods of loading, investigations have developed that a part of the trouble is chargeable to the manner in which packages are handled at destination points, with particular reference to recoopering and the disposition of salvage. The committee urged that the individual line representatives make a survey at each of their important delivery points with the view of applying necessary remedial measures.

For the seventh consecutive year claims paid for freight stolen in transit were reduced. The amount paid in 1927 was $1,151,136, which was 12 per cent less than in 1926, 88 per cent less than in 1921 and 41 per cent under 1914. Adding the claims charged to the companion causes, unlocated and concealed loss, the total for 1927 was $5,296,741 compared with $31,949,184 for 1921 or a reduction of 83 per cent in seven years. Compared to other claim causes there has also been great improvement, this class of claim having decreased from 33 per cent of the total claim payments in 1921 to 14 per cent last year. It is believed that still further improvement can be made in this account by a close checking of all contributing conditions, including the recoopering of broken packages.

Under the new furniture account, which amounted to $2,000,000, unlocated damage and rough handling of cars contributed $1,265,701 and concealed damage $646,924. While rough handling of cars was a factor, undoubtedly the major part of the damage resulted from innumerable conditions connected with the packing, crating and handling. In the belief that greater progress can be made by developing comprehensively the underlying causes, the types of furniture and the packing mainly responsible, the committee has proposed that a number of the railroads unite with the inspection bureaus and the A. R. A. Freight Container Bureau in an extensive survey of the problem.

This study will be made during October and will be under the direction of the Freight Claim Division, with the co-operation of the individual roads, the various freight inspection bureaus and the Freight Container Bureau. The necessary information will be obtained by the examination of shipments at the principal points of destination, which will probably include New York, Chicago, Atlanta, Ga., Houston, Tex., Dallas, St. Louis, Mo., Portland, Ore., Los Angeles, Cal., Boston, Mass., New Orleans, La., Kansas City, Mo., and Montreal, Que. The inspection reports will be sent to the Freight Container Bureau where they will be examined and tabulated currently during the period of the study.

### Scientific Investigation Will Cut Claims

The general opinion current in the discussion of the Prevention Committee's report favored a scientific investigation of container construction, loading and stowing methods, the condition of the roadbed, and the design of car springs, draft gears and other accessories to determine their effect upon load shifting and bracing and container failure. One railroad has studied the effects of vertical shifting and has experimented with a top bracing which prevents the load from leaving the floor. Another is conducting an investigation under the direction of the engineer of tests to ascertain the action of the load during switching operations and while traversing rough sections of the line. To obtain the necessary data, heavily loaded cars are placed on the rear of 80-car trains and men are placed in these cars to observe the conditions. Although the investigation is still in its

**Tub-Basket Supporting 1500 lb. Under Compression Test**

early stages it has been found that with a tight load the first impact causes the lading to buckle and remain in this position while with a loose load the merchandise bulges in the center and returns to its normal position. From the observations already made it is felt that transit vibration or vertical shifting contributes as much to breakage as the rough handling of equipment. In a few instances the vibration was so excessive that the men were unable to remain in the cars. As a result of the discovery of this situation a study will be made of the different types of springs and their effect.

The taking of photographs of the lading when the

car is opened at destination to impress shippers with the effects of proper and improper methods of loading, stowing and bracing was advocated as a means of eliminating irregularities in packing, loading, and unloading. Although the inspection of all cars at the point of origin is impossible it was felt advisable for the existing staffs of inspectors on the various roads to use automobiles in order to increase the number of cars inspected and further extend claim prevention education among shippers.

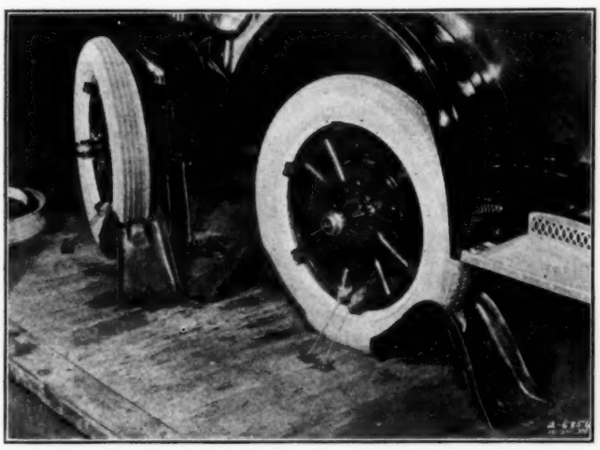
In the discussion of damage to fresh fruits and vegetables, which during the first three months of 1928 has increased $268,000 in contrast to a reduction of $423,000 in all loss and damage for the same period, certain containers were condemned. Recent investigations have shown that two sizes of hampers, the one bushel and the one and one-half bushel, are not being manufactured according to standard requirements and cannot be loaded and stowed properly in cars because of their peculiar shape and bulged top. It was suggested that the Freight Container Bureau pass a ruling forbidding the acceptance of these hampers when offered for shipment with bulged tops and requiring that the manufacturers' name, address, and specifications be stamped on each container. It was also recommended that the round bottom bushel basket be eliminated from the classification as a container for the shipment of miscellaneous fresh fruits and vegetables and that the flat bottom, tub shaped, bushel basket be specifically named as the container for the handling of miscellaneous fresh fruits and vegetables.

Several roads are studying the handling of watermelons, which commodity is being damaged under the present system of loading because of the development of a thin rind product. One road advocates the use of bulkheads to divide the lading into sections and another the handling of melons on the head end of trains. The

**Watermelons Present a Difficult Problem**

southeastern lines have organized a watermelon committee, composed of all originating watermelon lines. It is the intention of the committee to make tests on bedding, and padding and bulkheading or dividing the car into three compartments, which will give the melons about 10 or 12 ft. of space in which to shift instead of 36 ft.

"If we are to meet the conditions with which we are confronted today on the railroads of this country in even a fairly satisfactory manner," Mr. White said, "we must do it largely by eliminating waste and by increasing production. There appears to be little or no relief in sight to lighten our ever-increasing tax burden. You are all very familiar with the prevailing tendency of public regulating bodies to lower rates continually and to require very large expenditures for non-productive improvements. Although the population of our country is now and has been increasing at the rate of 21 per cent every ten years, railroad tonnage is not now increasing in a like proportion, or even in the same manner as in the past. In fact it is almost stationary. So we are still face to face with our constant problem of getting 'a little more out of what we already have.'



**Automobiles Must Be Properly Blocked**

"The particular work in this connection in which the claim departments of our railroads have been very helpful and can continue to be very helpful is, of course, in the elimination of waste; but if you are going to accomplish as much in this direction as I am sure you are anxious to accomplish, it is necessary that you have the whole-hearted and sympathetic support of not only the departments interested but the employees themselves.

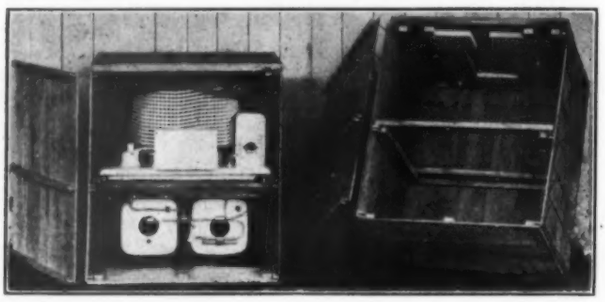
"I believe we will find generally, that the responsibility for claims falls heaviest upon the shoulders of the operating department which, of course, includes both the mechanical department and the conducting-transportation department.

"There seems to be no uniformity on our railroads as to the department responsible for handling the settlement of claims, and I will advocate no particular department. In fact, I do not believe it makes a great deal of difference so long as the personnel of the department is as it should be, but I do think a great deal depends upon the energetic enthusiasm this important work receives from the officers and employees engaged in handling the work of the operating department.

"Most railroads, I believe, use the plan of holding periodical meetings with transportation and mechanical department officers and a certain number of agents and employees selected from the ranks. The plan is excellent but I believe that as time goes on the enthusiasm begins to lag, some of the department heads are reported absent because of other important duties and too often a routine plan is followed that is tiresome and uninteresting. The members assume a sort of bored expression and the hour of adjournment is welcomed by most, if not all present. The minutes of the meeting, when read some time later, often indicate that an interesting meeting was held, while a careful analysis at the end of the year will not always disclose that a great deal has been accomplished as a result of these meetings under such circumstances.

"In my opinion one of the greatest opportunities for the elimination of waste, so far as claim prevention is concerned, lies in getting our operating departments sincerely and enthusiastically interested in this important question. I feel that this can best be accomplished by giving a great deal of careful thought to means and methods of making these meetings intensely interesting. Drop, so far as possible, routine programs and statistics and indicate the trend of the particular items in which men are interested in large highly colored charts.

"Good service never meant more than it does today, and by this same token poor service never cost as much as it does today. In my opinion a claim should be an



**A Container Developed Through Research**

indication to an operating man that there has been a failure of service—a failure in the working of that part of the transportation machine for which he is responsible. It should be handled quickly, the same as any other service failure. The investigation should be most thorough, the facts secured quickly and accurately and the patron properly cared for."

Mr. Aishton commended the division on its work and emphasized the importance of creating a proper understanding of rough handling. He quoted a yardmaster as saying that the average man does not comprehend damage to equipment. To eliminate rough handling, he suggested that enginemen be instructed to handle all cars in the same manner they would move cars containing their own household furniture.

In commenting on the carriers as a whole he said:

"The railroads have made an enviable record in the matter of increased operating efficiency in the past eight years, greater strides in that direction having been achieved by them than by almost any other industry. Reports for the first quarter of this year indicate that improved efficiency is not only being maintained but, for the most part, is also increasing, with indications that 1928 will prove to be a banner year.

"Largely as a result of this increased efficiency on the part of the railroads, the shippers of this country today are receiving the best and most dependable transportation service ever offered to them. So long as the railroads are able to furnish the public with dependable and satisfactory service, as they have done in recent years, I believe the carriers have little to fear from professional railroad baiters."

Mr. Parmelee discussed the system of statistical reports developed by the division.

"A statistical analysis must precede any attempt to reduce the economic waste growing out of loss and damage to freight. Not only must this analysis precede an attempted solution, but it must be continued throughout all the stages of your campaign to reduce freight claim expenditures. Only so can you be fully informed at every step what the situation is, how it may be changing, in what direction the greatest improvement has taken place, and in what respects further effort may be required.

"Considered broadly, any economic diagnosis must rest on a statistical foundation. To supply such a foundation is the primary function of freight claim statistics. Just what those statistics should be, how they should be collected and assembled, and what details should be covered, is a matter of continuous study.

"The important thing is to assure ourselves that the statistics are available in comparable form from year to year, that an intelligent analysis has been developed, that it is continued from month to month, and that it receives appropriate study and appraisal at all times.

"An interesting feature of the freight claim situation as a whole, is the extent to which the changing value of the dollar has contributed to the reduction in loss and damage payments since 1920. In gross dollars, the reduction between 1920 and 1927 was 67.7 per cent, or about two-thirds. When the decline in wholesale prices during that same period is taken into account, this reduction becomes 50.2 per cent, or about half. That is, even if prices had remained stationary, and the purchasing power of the dollar had been the same in 1927 as in 1920, freight claim reduction would still have exceeded over one half—no mean achievement, especially when we recall that the revenue ton miles actually increased nearly 5 per cent during the same period of seven years.

"Many statistical factors enter the problem. The amount of freight traffic is one, measured either in car-loadings or car-miles, or tons or ton-miles. The value of the goods handled is another, this factor being one that involves the question of relative price levels. Still other factors are the weather, the prevalence of disasters such as serious floods, and the existence of so-called 'crime waves' which affect the robbery or theft losses."

* * *

*From a Painting by Walter L. Greene*

**G. E. Motor Generator Locomotive on the Great Northern**

# Determining the Labor Cost of Tracklaying and Surfacing

*A comparison of five formulae for arriving at an accurate estimate of actual expenditure*

By H. E. Hale

Vice Chairman, Eastern Group, Presidents' Conference Committee on Valuation, New York

YEARS ago, the only occasion when it was necessary to estimate the labor cost of building track was in making estimates for new construction work and this was usually estimated at an average figure of so many cents per foot or dollars per mile, guided solely by the personal opinion of the engineer in charge of the work. This condition was changed by the passage of the Valuation act in 1913. Neither the Interstate Commerce Commission nor the carriers were willing to accept the personal opinion of an engineer as to the labor cost of constructing track and the great range of costs of this item made an average cost per foot or mile useless and often such average cost, when applied to individual cases, became ridiculous.

The first striking feature of all the studies of this subject by the Interstate Commerce Commission and the carriers is the enormous amount of data which the engineers were able to collect, covering the actual cost of laying 15,141 miles of track. This is an amount of track equal to five times the distance across the United States from the Atlantic to the Pacific and certainly should be sufficient to enable one to arrive at a correct estimate of the cost of tracklaying and surfacing.

Five principal formulæ to determine the cost of labor of building track have been developed as follows:

(1) California Railroad Commission's Formula, Feb. 1, 1913.

(2) "Formula F, January, 1919" by eastern carriers, Jan. 30, 1919.

(3) "Memorandum 733" by Bureau of Valuation (I. C. C.), Nov. 5, 1919.

(4) "Schedule 1" by western carriers, Oct. 1, 1924.

(5) "Boston & Maine Schedule" by eastern and southern carriers, May 2, 1927.

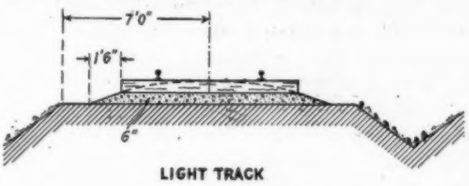
There is a remarkable similarity between all five formulæ. Each of them makes adjustments for such variables as weight of rail, amount and kind of ballast, number of switches, frogs, tie plates, etc., and maintenance during construction. The engineers for the Commission and the carriers reached different conclusions, but were in agreement on one principle, namely, that to determine the cost of Account 12 (labor only), Tracklaying and Surfacing, they all found it necessary to adopt a formula.

## Great Variation in Cost of Track

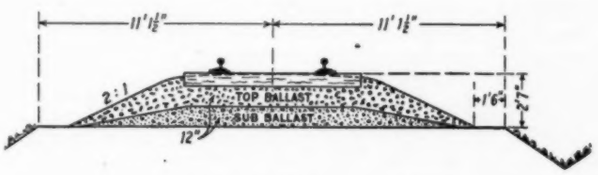
The development of a formula for this purpose is only possible when great masses of data are available for study and analysis—and this work will make it possible for construction and maintenance engineers as well as valuation engineers, to make much more reliable estimates in the future.

At a conference on this subject not many months ago, a prominent officer asked "Why does everybody get mad when they discuss the cost of track-laying and surfacing?" It is an astonishing fact that a great deal of temper has been lost in trying to get at the cost of building this simple structure, with which we are all so familiar. Probably most of these disagreements are caused by the many different kinds of track, with corresponding differences in cost.

For example, an engineer may have just completed the construction of a stretch of track for heavy fast traffic with 135-lb. rail, fully tie plated, with two feet or more of good ballast under the ties and surfaced with the so-called "glass finish". For this work he may have approved bills for over $4,000 per mile for labor alone and felt that he had done the work economically. Another engineer, under different circumstances, may have laid track with 60-lb. rail, no tie plates, cementing gravel ballast and surfaced for slow speed at a cost of $1,200 per mile for labor only; and he may have been justified in feeling that he had spent sufficient money for this track for the light slow speed traffic that it was built to handle.




LIGHT TRACK




HEAVY TRACK

Fig. 1

Now, bring these two men together and ask them what the cost of laying a mile of track is, and the reason for good tempers being lost on this subject will soon be evident. The engineer whose track cost him $4,000 cannot believe that track can be built for $1,200 and generally assumes that the other engineer "buried" his costs in other accounts, whereas the engineer who built track for $1,200 wants to know why the other man squandered the company's money and frequently says so in plain English.

Here we have a track built for heavy traffic and high speeds, which is a very different structure from the track built for light traffic at slow speeds and yet both have a gage of 4 ft. 8½ in., both will carry trains and they look quite similar to the casual observer. The cross sections illustrated above show the real difference between heavy and light track.

The cost of laying skeleton track, which is the first operation in building the track structure, is much affected by the weight of rail. A 60-lb rail, 30 ft. long and weighing 600 lb. can easily be handled by 12 men, but a 135-lb. rail 33 ft. long, weighs 1,485 lb. and is usually handled by machine, or if placed by hand requires 28 or 30 men. This condition is brought forcibly to mind by considering the cross sections of the two rails, as follows:

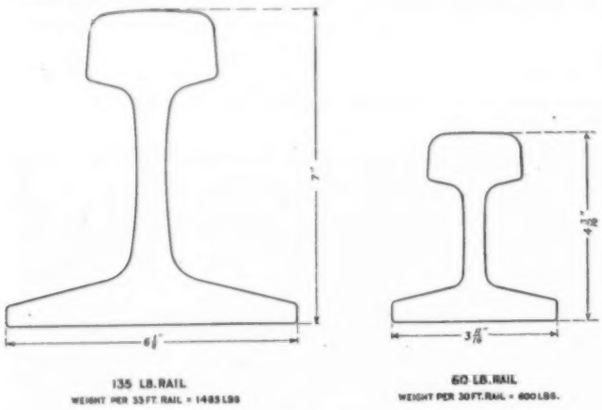



Fig. 2

## The Five Formulæ

The first formula was developed by the Railroad Commission of California and dated February 1, 1913. This formula distinguished between the cost of laying ballasted and unballasted skeleton track. It recognized the additional cost of hauling men and supplies long distances. It provided a "variable" for the cost of maintaining long stretches of track during construction, as comp red with short stretches and determined the cost of applying ballast, based on the number of yards of ballast used and the kind of ballast. It also provided for extra costs of applying switches, tie plates, etc.

The California Railroad Commission never produced any supporting data on which this formula was based, so far as the writer knows, but this Commission is entitled to great credit for producing the first formula for determining the labor cost of building track. While it is not generally applicable to various kinds of track, it provided adjustments to cover most of the "variables" in this cost and blazed the way for other formulæ.

This formula did not provide an adjustment of cost for a variation in price paid labor, and while the importance of this variable in 1913 was not apparent to engineers dealing with a fairly stable labor market, the upset of labor prices during the war soon demonstrated the importance of an adjustment for changes in prices paid labor.

Neither did it provide for an adjustment in cost for different classes of track, such as slow speed track, and high speed track which latter requires more labor to remove imperfections of line and surface. This difference in class of track was not so pronounced in California, where most of the new track was opened for operation at a speed of about twenty miles per hour. There is, however, a very marked difference in the East and the Central West, where new track is opened for operation at 60 miles per hour, such as the joint track of the Big Four and C. & E. I. east of St. Louis, or 75 miles per hour as in the case of the Philadelphia Short Line of the Reading.

The second formula for determining the cost of labor for laying track was developed by a committee of engineers of the Eastern Group carriers with Charles Hansel as chairman and was called "Formula F, January, 1919". This formula was, to a large extent, modeled after that of the California commission and with a few minor exceptions covered the same variables. It did, however, provide two major additions:

*First*, an adjustment for changes in rates paid labor, that is, if the labor rate increased, the formula provided that the total cost of laying track would increase in proportion and vice versa, because it was found that 95 per cent of this account was labor and the remaining 5 per cent, such as coal for engines, was largely influenced by the price paid labor.

*Second*, an adjustment in cost for different classes of track, although they contained identically the same items of material; that is, track capable of handling traffic at high speeds was estimated to cost more than slow speed track because it required more labor to remove the imperfections of line and surface for high speed traffic. When a track is constructed for high speed it must have a perfect surface and a "high polish" and it always costs more for labor to produce a high polish than a rough surface.

RAILROAD COMMISSION OF CALIFORNIA
COST PER MILE OF
TRACK LAYING AND SURFACING

Based on Completing twenty miles of track in thirty days.

| ITEM | Rail under 50 lbs. Ballasted Track | Rail under 50 lbs. Unballasted Track | Rail 50 to 70 lb. inc. Ballasted Track | Rail 50 to 70 lb. inc. Unballasted Track | Rail 71 to 90 lb. inc. Ballasted Track | Rail 71 to 90 lb. inc. Unballasted Track |
|---|---|---|---|---|---|---|
| Material Yard Expense | 100.00 | 100.00 | 120.00 | 120.00 | 140.00 | 140.00 |
| Labor Laying Track | 200.00 | 200.00 | 225.00 | 225.00 | 250.00 | 250.00 |
| Labor Surfacing Track | 120.00 | 300.00 | 130.00 | 325.00 | 140.00 | 350.00 |
| Train Service | 110.00 | 100.00 | 115.00 | 105.00 | 135.00 | 125.00 |
| Rent of Equipment | 100.00 | 90.00 | 115.00 | 100.00 | 120.00 | 110.00 |
| Use of Tools-2% Labor | 24.00 | 12.00 | 25.00 | 14.00 | 28.00 | 16.00 |
| Injuries, etc.2% Payrolls | 26.00 | 14.00 | 27.50 | 17.00 | 29.00 | 20.00 |
| Transportation of men | | | | | | |
| 100-200M.from Labor Mts. | 25.00 | 18.25 | 27.50 | 22.50 | 30.00 | 26.25 |
| 200-300" " " " | 40.00 | 28.12 | 45.00 | 31.25 | 50.00 | 35.00 |
| 300-400" " " " | 50.00 | 35.00 | 55.00 | 39.37 | 60.00 | 43.75 |
| Transportation of Supplies | | | | | | |
| 100-200M.from Labor Mts. | 7.25 | 5.00 | 10.00 | 7.50 | 12.75 | 10.00 |
| 200-300" " " " | 12.00 | 7.50 | 17.00 | 12.00 | 20.00 | 15.00 |
| 300-400" " " " | 17.00 | 10.00 | 24.00 | 15.00 | 30.00 | 20.00 |
| No transportation where work is less than 100 miles from labor markets. | | | | | | |
| Maintenance during construction. | | | | | | |
| 25-100 miles long (a) | 100.00 | 150.00 | 120.00 | 175.00 | 140.00 | 200.00 |
| 100-200 " " (b) | 150.00 | 225.00 | 180.00 | 265.00 | 210.00 | 300.00 |
| Over 200 " " (c) | 200.00 | 300.00 | 240.00 | 350.00 | 280.00 | 400.00 |
| (a) - 2 year construction period | | | | | | |
| (b) - 3 " " " | | | | | | |
| (c) - Over three years and applicable to mountain or desert only. | | | | | | |
| Placing Switches (split) | 25.00 | 25.00 | 30.00 | 30.00 | 35.00 | 35.00 |
| Placing Switches (stub) | 20.00 | 20.00 | | | | |
| Placing Switches (double slip) | | | | | 100.00 | 100.00 |
| Note - Where switches occur in "ladder" tracks in considerable yard layouts slip switches, etc. special prices to apply. | | | | | | |
| Placing Crossing Frogs | 12 1/2% of cost of rotel at California Terminals. | | | | | |
| Tie Plating | For flat bottom tie plates all weights of rail.01-1/4 per tie plate. | | | | | |
| Curving Rails | Rails under 50 lb. not necessary to curve. | | | | | |
| | " 50-70 inclusive - 30¢ each. | | | | | |
| | " 71-90 37¢ each. | | | | | |
| Placing Ballast | Sand, Cinders, etc., 15¢ per cu. yd. | | | | | |
| | Gravel 20¢ " " " | | | | | |
| | Crushed stone 35¢ " " " | | | | | |

### California Railroad Commission's Formula

Closely allied with "Formula F, January, 1919" is the report of J. W. Stone, valuation engineer of the Pennsylvania, on "Deferred Construction Costs," presented by him in the Pennsylvania case on May 22 and 23,

1922. In this report, Mr. Stone assembled the actual cost of completing the track, usually done after the track is in operation. He showed that this cost was much greater for high speed than for slow speed track, owing to the necessity of resurfacing and relining many times to remove inequalities for high speed.

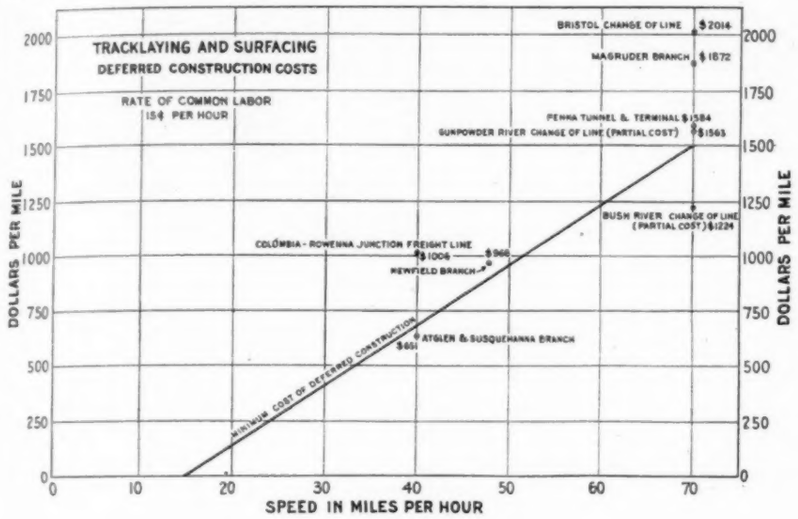



Fig. 3

Mr. Stone's conclusions were given in his Exhibit No. 18, as follows:

formula as to most of the variables, but was in much simpler form. It provided for an adjustment in the cost of laying track for ballasted compared with unballasted track, for an adjustment in cost due to different weights of rail, for the amount and kind of ballast, for the number of switches, tie plates, rail braces, anti-creepers and bridge ties. It also provided for an adjustment of cost for transporting men and supplies distances greater than 100 miles, similar to the California Commission's formula. This formula, however, did not make any adjustment for rates paid labor or for class of track, such as high speed and slow speed.

The fourth formula was known as Schedule 1, dated October 1, 1924, developed by the Western Group carriers Cost Data Committee. It was based on a careful and painstaking analysis of the cost of 10,360 miles of track costing $16,177,867. The costs of the projects were broken down into their parts and the average cost of each part determined. New subdivisions were thus developed, such as the cost of maintenance during construction "per mile month." It did not, however, cover the cost of transporting men, outfits and supplies. The formula, together with its supporting data,

EXHIBIT "F - JANUARY 1919"

PRICES FOR ESTIMATING ACCOUNT 12 - TRACKLAYING AND SURFACING

| Item | Under 65 lb. | 65 lb. | 70 lb. | 75 lb. | 80 lb. | 85 lb. | 90 lb. | 100 lb. | 110 lb. |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | WEIGHT OF RAIL | | | | |
| | | | | | BALLASTED TRACK | | | | |
| Skeleton Track | $580.00 | $600.00 | $620.00 | $650.00 | $680.00 | $720.00 | $760.00 | $800.00 | $840.00 |
| Transportation of Men | 40.00 | 45.00 | 45.00 | 50.00 | 50.00 | 50.00 | 50.00 | 55.00 | 55.00 |
| Transportation of Supplies | 12.00 | 15.00 | 15.00 | 20.00, | 20.00 | 20.00 | 20.00 | 25.00 | 25.00 |
| | | | | | UNBALLASTED TRACK | | | | |
| Skeleton Track | $940.00 | $960.00 | $980.00 | $1000.00 | $1020.00 | $1040.00 | $1070.00 | | |
| Transportation of Men | 30.00 | 30.00 | 30.00 | 35.00 | 35.00 | 35.00 | 35.00 | | |
| Transportation of Supplies | 8.00 | 10.00 | 10.00 | 15.00 | 15.00 | 15.00 | 15.00 | | |
| Placing Switches (Split) or Railroad Crossings | $30.00 | $35.00 | $35.00 | $40.00 | $40.00 | $40.00 | $40.00 | $50.00 | $50.00 |
| Placing Switches (Stub) | 20.00 | | | | | | | | |
| Placing Movable Point Frogs | 60.00 | 70.00 | 70.00 | 80.00 | 80.00 | 80.00 | 80.00 | 100.00 | 100.00 |
| Placing Double Slip Switches | 90.00 | 105.00 | 105.00 | 120.00 | 120.00 | 120.00 | 120.00 | 150.00 | 150.00 |
| Applying tie Plates, Flat Bottom, Per Plate | 1 1/4¢ | 1 1/4¢ | 1 1/4¢ | 1 1/4¢ | 1 1/4¢ | 1 1/4¢ | 1 1/4¢ | 1 1/2¢ | 1 1/2¢ |
| Applying Anti-Creepers 2¢ each. | | | | | | | | | |
| Applying Rail Braces, 2¢ each. | | | | | | | | | |

NOTE: Where switches occur in "ladder" tracks in considerable yard layouts slip switches, etc., special prices to apply.

Placing Ballast:

| | | | |
|---|---|---|---|
| Cinders, etc. | 27¢ per cu. yd. | Gran. Slag | 27¢ per cu.yd. |
| Unwashed Gravel | 27¢ per cu. yd. | Shell | 27¢ per cu.yd. |
| Coarse Washed Gravel | 37¢ per cu. yd. | Sand | 22¢ per cu.yd. |
| Crushed Stone | 37¢ per cu. yd. | Chert | 27¢ per cu.yd. |
| Broken Slag | 37¢ per cu. yd. | Chatts | 27¢ per cu.yd. |

Lining and Surfacing During Construction: Keeping up track during construction and shaping it for beginning traffic for ballasted track - Multiply $10.00 by the maximum speed of passenger or freight trains in miles per hour permitted during the first week of operation. For earth surface multiply $20.00 by maximum speed.

NOTE NO. 1 - It is distinctly understood that nothing in the above figures is intended to cover the COST OF DEFERRED CONSTRUCTION AFTER OPENING FOR OPERATION, sometimes spoken of as "Excess Cost of Maintenance subsequent to Opening for Operation".

NOTE NO. 2 - These costs are all based on the common labor rate of pay of 15¢ per hour.

NOTE NO. 3 - The cost of APPLYING BRIDGE TIES, guard rails for bridge or curve, derails, placing bumping posts and rail rests, and curving rails is not included in the above and should be estimated separately.

NOTE NO. 4 - The above costs do not apply to laying track in paved streets.

### "Formula F, January, 1919" by the Eastern Carriers

The third formula developed was known as "Memorandum to the Engineering Board No. 733", dated November 5, 1919. This formula was developed by the Engineering Board of the Interstate Commerce Commission. It also followed the California Commission's was very ably presented at the valuation hearing of the Great Northern by W. C. Mock, valuation engineer of the Oregon-Washington Railroad & Navigation Company, on March 11 and 12, 1924, at which time the studies of his committee were fully described, together

with a detailed description of the method of arriving at the cost of each item of this formula.

Closely allied with Schedule 1 is the report on Deferred Construction Costs by H. M. Tremaine, presented

Washington, D. C.
Nov. 8, 1919.

Memorandum to the Engineering Board No. 733:

For the sake of brevity, only the formula for tracklaying and surfacing has been copied from Memorandum 733. The full text can be obtained from the Bureau of Valuation and is on file with practically all carriers.

"The Board recommends that the following unit prices shall be approved for pricing under Account 12, Tracklaying and Surfacing, to apply under conditions that are normal and ordinary:

1. For tracklaying and light running surface to be applied to track that is generally ballasted shortly after being laid.

| | |
|---|---|
| a. Rail 60 lb. and under | $600 to $800 per mile. |
| b. Rail 61 lb. to 90 lb. | 825 to 925 per mile. |
| c. Rail over 90 lb. | 850 to 1000 per mile. |

2. For tracklaying with full earth surface to be applied to unballasted track, add $75 to $150 per mile to the prices derived under Paragraph No. 1.

| | |
|---|---|
| 3. For placing ballast. | |
| a. Sand and cinders | 15¢ to 20¢ per cu. yd. |
| b. Gravel and screenings | 20 to 25 per cu. yd. |
| c. Crushed rock and slag | 25 to 35 per cu. yd. |
| 4. For placing switches | $25 to $35 each. |
| 5. For installing railroad crossings | |
| a. Ordinary crossings | $35 to $50 each. |
| b. Complicated crossings | 40¢ to 50¢ per cwt. |
| 6. For placing tie plates | 1½¢ each. |
| 7. For placing rail braces and anti-creepers 8¢ each. | |
| 8. For framing bridge ties | $10 per MBM |

In case of track laid at distances from available labor markets greater than 100 miles, the above prices may be increased to include the additional cost of transportation of men, supplies and outfits.

When ballasting is done after operation begins, the base cost for full earth surfaced track, or a part thereof, shall be used, to which shall be added the cost of placing the ballast.

In determining the units for tracklaying and surfacing the entire track mileage shall be taken without deduction for mileage of bridges and trestles, because of the fact that contracts are made on this basis and it is necessary to rely on the contract data for support."

Original signed by

C. A. Prouty
Director.

**"Memorandum 733" by the Bureau of Valuation (I.C.C.)**

and described in detail in the Great Northern case on February 18, 19 and 20, 1924. This report deals with the cost of completing the new track, usually deferred until after opening for operation. The result of Mr. Tremaine's study is given in a tabulation and also a diagram, Great Northern Exhibit No. 46, and shows that for 29 projects covering 1,028 miles of new line, the total "deferred track construction costs" equaled 257 per cent of one year's normal maintenance cost (Account 220).

The fifth formula on the cost of labor of constructing

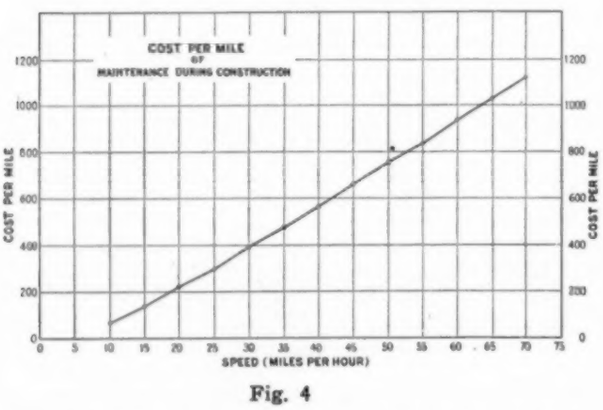



**Fig. 4**

track is known as the "B. & M. Pricing Schedule for Account 12," dated May 2, 1927, developed by the Tracklaying committee of the carriers of the Eastern and Southern groups. This formula followed the same principles as those in the California Commission's formula, insofar as it provided adjustment of cost for such variables as weight of rail, amount and kind of ballast, number of tie plates, switches, frogs, etc., but made no adjustment for transportation of material and supplies for long and short distances. It, however, provided for an adjustment of cost due to changes in the price of labor, which was so forcibly brought to the attention of the committee by the upset of labor prices during the war, when the great rise in labor rates forced up the cost of all construction that was dependent on labor. It also provided for the increase of cost of higher speed track over low speed track owing to the cost of relining and resurfacing to remove inequalities of track for the movement of trains at high speed. This is the old story of the high cost of producing a smooth surface

SCHEDULE I

WESTERN GROUP COST DATA COMMITTEE
SUB-COMMITTEE ON TRACKLAYING AND SURFACING
PRICE SCHEDULE

(Exclusive of Transportation of Men, Outfits and Supplies)

| Item | Unit | 81 lb. to 90 lb. Track | 60 lb. and Under Track |
|---|---|---|---|
| 1. Labor Laying Track | Mile | $367.50 | $320.00 |
| 2. Labor Running Surface | " | 85.00 | 65.00 |
| 3. Work Train Service: | | | |
| Ballasted Track | " | 250.00 | 200.00 |
| Earth Surfaced Track | " | 215.00 | 175.00 |
| 4. Rent & Repair of Equipment | | | |
| Ballasted Track | " | 200.00 | 160.00 |
| Earth Surfaced Track | " | 165.00 | 140.00 |
| 5. Use of Tools | ) | | |
| 6. Liability Insurance) | | Included in Labor Costs at 6% | |
| 7. Miscellaneous Costs) | | | |
| 8. Maintenance during construction | Mile-Month | 14.50 | 14.50 |
| 9. Full Earth Surface | Mile | 385.00 | 320.00 |
| 13. Placing Guard Rail | Lin. Ft. | $0.085 | |
| 14. Placing Switches | Each | 30.00 | |
| 15. Placing Tie Plates | " | 0.01-1/4 | |
| 16. Placing (Rail Braces | " | 0.025 | |
| (Anti-Creepers | " | | |
| 17. Placing Crossings | " | 47.00 | |
| 18. Placing Derails | " | 13.00 | |
| 19. Placing Bridge Ties | M.B.M. | 14.00 | |
| 10. Placing Ballast | Cu. Yd. | | |
| Gravel | | 0.28 | |
| Volcanic Cinders | | 0.28 | |
| Gyp Rock | | 0.28 | |
| Chats | | 0.35 | |
| Crushed Rock | | 0.35 | |
| Slag | | 0.35 | |
| Screenings | | 0.38 | |

Note: "Running Surface" not to be included in price for "Full Earth Surface" Track.

Note: The prices enumerated herein apply without differentiation to all tracks, (Main, Side and Other).

**"Schedule 1" by the Western Carriers**

or high polish which always costs more than a rough finish. The actual cost of maintenance during construction of high speed compared with slow speed track was determined with great accuracy in this case and is shown in Fig 4 at the bottom of the preceding column.

This B. & M. schedule of prices was based on a most thorough investigation of all available data in the Eastern and Southern groups, covering 152 projects with 4,781 miles of track, which cost $10,927,631. Each project was investigated carefully by a competent engineer, who testified under oath as to the actual cost and gave a full description of the track constructed. From this study the B. & M. schedule or formula was developed. This B. & M. schedule covers the same "variables" as "Formula F, January, 1919" and on an average produces about two per cent more cost. The principal increases are in the higher speed track. To obtain the complete cost of tracklaying and surfacing, there must be added to the amount produced by the B. & M. schedule the "cost of deferred construction" developed by J. W. Stone in his Exhibit No. 18 referred to above.

### Methods of Making a Formula

When it is possible to do so, the most satisfactory method of making a formula is to determine the cost of each item in the formula from the actual cost of that particular item of track construction, such as the cost of skeleton track, the cost of applying ballast per yard, etc. But as the classification of accounts issued by the Interstate Commerce Commission does not provide for this separation of cost items, the carrier's records of cost

of track construction have never been kept separate for each item and it is practically impossible to go back and redistribute the recorded costs under each sub-heading or cost item.

The engineers, however, had certain information to assist them in the solution of the problem, as follows:

(a) A correct total cost of many tracklaying projects;
(b) A correct inventory of the material used and a description of the character of track built;
(c) A practical knowledge of the variables which affect the labor cost of track construction and their approximate cost.

If, then, an empirical formula could be devised which included the major variables, and it was found that this formula, when applied to different groups and classes, produced a total cost equal to the actual cost of these groups and classes, then the correctness of the formula would be demonstrated.

This was exactly the method followed in developing and perfecting "Formula F, January, 1919" and it is interesting to note that the committee tried out 11 different formulæ before adopting the one which agreed most closely with the actual facts. This formula has since been tested many times. The most severe and critical test was in the case of the B. & M., where, in the final tabulation, "Formula F, January, 1919" produced a cost about 2 per cent less than the actual cost.

### Tests by Comparative Tabulations

As the five general formulæ were developed, they were usually compared with actual known costs of tracklaying in what might be called comparative tabulations, or tests to determine their accuracy. So far as we know, the California Railroad Commission never made a comparative tabulation of the estimated cost of tracklaying by its formula with actual cost. Such tabulations have been made but as they were not approved by engineers representing the California Commission or sworn to by a competent witness in any hearing, they are not presented here.

The first comparative tabulation presented at a valuation hearing before an Interstate Commerce Commission examiner was in the New York, Ontario & Western case on March 1, 1923, by the writer, as his Exhibit No. 51. The following is a general summary tabulation of four statements presented in valuation hearings, testing the accuracy of the four formulæ:

The tabulation in the N. Y., O. & W. case was made on December 19, 1918, although it was not presented until March 1, 1923. Quite a number of the projects included in this early tabulation were later revised by the Eastern, Southern and Western groups, owing to extended investigation of the underlying cost records. These revisions, however, resulted in some increases and some decreases in the reported cost and it is remarkable to note that with all the minor revisions of the reported costs of individual projects the later tests showed "Formula F" remarkably correct and slightly conservative.

In the N. Y., O. & W. tabulation, "Formula F, January, 1919" produced an estimated cost slightly in excess of the actual cost of these tracklaying projects (two per cent) and the committee decided to make no further refinements in the formula, as it was known that the reported costs in Column two did not include a number of charges in certain projects, such as work train service, etc., properly chargeable to Account 12 and that these omissions more than equaled 2 per cent. The correctness of this decision was confirmed by the test in the B. & M. case seven years later.

B. & M. SCHEDULE

The projects from which this pricing schedule was developed were ballasted track.

(1) Laying Skeleton Track With Such Surfacing as is Performed Prior to the Placing of Ballast.

| | |
|---|---|
| (1) Rail 61 lb. to 90 lb. | $ 975 per mile |
| (2) Rail over 90 lb. | $1049 per mile |

(2) Cost of Placing Specials
For placing switches.....$25 to $35 each
For installing railroad crossings:
(a) Ordinary crossings.....$35 to $50 each
(b) Complicated crossings.....40¢ to 50¢ per cwt.
For placing tie plates.....1-1/4¢ each
For placing rail braces and anti-creepers.....2¢ each
For framing bridge ties.....$10 per MBM

(3) Placing Ballast
(a) Sand and Cinders.....20¢ per cu. yd.
(b) Gravel and Screenings.....25¢ per cu. yd.
(c) Crushed Rock and Slag.....35¢ per cu. yd.

(4) Cost of Surfacing and Lining and Maintenance During Construction, Following the Placing of the Ballast, Which is Necessary to Construct a New Unseasoned Track in Condition for Operation at the Speed at Which it Was Actually Operated on Valuation Date.

| | | | |
|---|---|---|---|
| For 10-mile track | $65 per mile | For 45-mile track | $ 660 per mile |
| For 15-mile track | 140 per mile | For 50-mile track | 755 per mile |
| For 20-mile track | 220 per mile | For 55-mile track | 835 per mile |
| For 25-mile track | 295 per mile | For 60-mile track | 930 per mile |
| For 30-mile track | 390 per mile | For 65-mile track | 1025 per mile |
| For 35-mile track | 470 per mile | For 70-mile track | 1120 per mile |
| For 40-mile track | 565 per mile | | |

(5) The weighted average labor rate for all of these projects used in the pricing schedule was 15.7¢ per hour. If a carrier is able to establish that during the pricing period its prevailing labor rate level was higher or lower than 15.7¢ so that a schedule based on an average labor rate of 15.7¢ per hour is not representative of pricing period costs, and an adjustment for labor rate is essential, any required adjustment may be made from the average labor rate represented by the pricing schedule.

(6) Remarks:
The method does not include any of the excess cost of maintenance during the early period of operation (the so-called seasoning cost) which is also referred to as "deferred construction cost".

**"Boston & Maine Schedule" by the Eastern and Southern Carriers**

The second comparative tabulation was presented in the Great Northern case on March 11 and 12, 1924, Exhibit No. 123, by W. C. Mock, valuation engineer of the O. W. R. R. & N. Co. This tabulation was given in great detail for each of the 19 units covered in "Schedule 1." The principal units were 10,360 miles of skeleton track, 65,147 mile months of "maintenance during construction," 18,535,349 cu. yd. of ballast, etc. This tabulation was based on the most careful search of all available records on cost of tracklaying in the Western group. For the problem in hand, namely, to prove the correctness of Schedule 1, this investigation went to the limit of reasonable engineering effort in volume of data collected and care of analysis.

In a final effort to obtain the correct facts as to the actual cost of tracklaying and surfacing, in 1925 the carriers of the Southern and Eastern groups combined and presented all the data they could obtain on this subject in the B. & M. case. They employed a special attorney and appointed a special committee of engineers with J. H. Roach, chief valuation engineer of the New York Central Lines as chairman, to direct the case. They further arranged for a large number of competent

**General Summary Tabulation**

| Miles of Track (1) | Actual Cost (2) | "Formula F, Jan., 1919" (3) | "Schedule 1" (4) | "Memorandum 733" (5) | "B. & M. Schedule"** (6) | Valuation hearing at which details were given (7) |
|---|---|---|---|---|---|---|
| 9,531 | $16,342,812* | $16,627,969* | | | | N. Y. O. & W., Mar. 1, 1923 |
| 10,360 | 16,177,867 | | $16,163,786 | | | Great Northern, Mar. 11 and 12, 1924 |
| 4,613 | 10,421,752 | 9,386,573 | | $7,789,594 | | B. & M., Apr. 1, 1926 |
| 2,304 | 5,669,304 | 5,534,832 | | 4,420,667 | $5,669,304** | B. & M., Apr. 1, 1926 |

NOTE: (1) * Adjusted to 15 cent labor rate.
(2) ** B. & M. Schedule was based on actual cost in Col. 2 and varied from it less than 1 per cent.

engineers to inspect each project and review all of the cost records and present the actual cost of each project under oath. All this data was summarized in one tabulation, Exhibit 394, presented by John O'Brien, assistant group engineer of the eastern group, which included 152 projects, covering 4,781 miles of track. In all, 38 witnesses testified in this case on the cost of track laying alone.

For 6 of the 152 projects, sufficient data were not reported to make a complete comparison, leaving 146 projects. The engineers who inspected the projects and examined the cost records applied "Formula F, January, 1919" to the actual quantities and compared this with the estimated cost of the same projects by Interstate Commerce Commission engineers, based on Memorandum 733. As the whole exhibit is voluminous, only the totals of the comparative tabulation are given above in the general summary tabulation. These 146 projects were well distributed over the southern and eastern groups, as was shown at the hearing by a map on which was shown the location of each project, and therefore this tabulation gives very representative data for that part of the United States east of the Mississippi river.

During the Boston & Maine hearing a restricted comparative tabulation was presented which has a number of interesting features. This tabulation was restricted to track built in the Eastern group only, on the assumption that this data covered the cost of track built for fairly similar traffic conditions. In this tabulation, projects were eliminated where the supporting cost records were not complete and small omissions had to be estimated. A portion of this table is given, as follows:

| Class of track (Speed in miles per hour) (1) | No. of Projects (2) | Miles of Track (3) | Reported Actual Cost (4) | Formula F, Jan., 1919 (5) | Memorandum 733 (6) |
|---|---|---|---|---|---|
| 1 to 20 | 32 | 723 | $1,496,152 | $1,472,075 | $1,272,503 |
| 21 to 40 | 36 | 1,455 | 3,744,175 | 3,684,935 | 2,865,733 |
| 41 to 60 | 7 | 94 | 286,730 | 256,363 | 192,279 |
| Over 60 | 3 | 42 | 142,247 | 121,459 | 90,152 |
| | 78 | 2,304 | 5,669,304 | 5,534,832 | 4,420,667 |

NOTE: The B. & M. Schedule was based on Col. 4 and varied from it by less than 1 per cent.

This tabulation makes a division between classes of track and shows clearly that while the Boston & Maine schedule (Col. 4) and "Formula F, January, 1919" (Col. 5) both make adjustment for the higher cost of high speed track, Memorandum 733 (Col. 6) places the same estimated cost on high speed track as slow speed track, where the same material is used. The resulting discrepancy is shown clearly in this comparison of Memorandum 733 with the actual cost of high speed track, which discrepancy increases as the speed increases. The higher cost of high speed track is due to the greater amount of labor necessary to produce the more perfect line and surface.

Particular attention is called to the fact that in the tabulation made on December 19, 1918, covering 9,531 miles, "Formula F, January, 1919" was 2 per cent above the actual cost, whereas in this last comparative tabulation made in 1926 covering 2,304 miles this formula is 2 per cent below the actual cost. During these seven years a most extensive study of all railroad construction costs was made by engineers of the Interstate Commerce Commission and of the carriers and their reports were freely exchanged. Therefore, when consideration is given to the great expense and care with which the carriers presented their data in the B. & M. case in 1926, this close check is a remarkable confirmation of "Formula F, January, 1919" developed by a committee of engineers seven years before.

## General Conclusions

Three of the formulæ, viz, the "California," "Memorandum 733" and "Schedule I," do not make adjustment in total cost for changes in rates paid labor, while two of the formulæ, viz: "Formula F, January, 1919" and the "B. & M. Schedule" do. The effect of a change in labor rate was not so evident before the war, because of a fairly stable labor market, but the upset of labor rates caused by the war brought the effect of this item of cost very forcibly to the attention of all engineers. The great increases in labor rates during the war forced up the cost of all construction work that was dependent on hand labor, as is the case in laying track.

The same three formulæ do not provide for an adjustment for the greater amount of labor required to produce a high speed track compared with slow speed track, whereas "Formula F" and the Boston & Maine schedule provide for higher prices for building high speed track to take care of the relining and resurfacing necessary to remove inequalities for handling high speed trains. The high speed track, of necessity, must receive a more perfect finish or what might be termed a higher polish. This higher polish always costs more for labor than a rough finish and in this respect laying track is no exception.

From all this study the first point seems clear, namely, if it is desired to determine the cost of labor of track-laying on various kinds of track with reasonable accuracy, it is necessary to use a formula which provides an adjustment for each of the many variables. The second point, namely, as to which formula is correct, is not so definitely settled. Time alone will demonstrate whether engineers will put their stamp of approval on one of these five formulæ or devise a new and better one.

The most correct formula of these five certainly provides a far more accurate method of determining the cost of labor of building track than any previous method in use. This work, therefore, will benefit construction and maintenance engineers who make estimates for new improvements, as well as valuation engineers. If the writer had had such a formula when he was making estimates for new construction work, he would not have been called on so frequently to explain why his cost of building track overran his estimates.

* * *

**Mucking Out the Rock from the Last Shot Which Completed the Pioneer Bore of the Great Northern Cascade Tunnel on May 1**

# Higher Mail Rates Proposed

## *Proposed report by I. C. C. Attorney-Examiner says present rates too low*

WASHINGTON, D. C.

A 15 per cent retroactive increase in the rates of pay for the transportation of mail matter and a new scale of rates for the future representing somewhat more than a 13 per cent increase are recommended by Attorney-Examiner Mullen of the Interstate Commerce Commission in a proposed report in the railway mail pay case, which was re-opened by the commission on July 24, 1925, for a re-examination of the rates prescribed in its order of December 23, 1919. As a result of the re-examination the report recommends a finding that the rates paid under that order are not fair and reasonable and that the increase of 15 per cent should be added to the compensation paid from the dates on which applications for re-examination were filed by the railways in 1925, or, in the case of roads which did not file applications, from July 24, 1925, to the date the rates to be established for the future become effective.

For separately operated short lines not exceeding 100 miles in length, Mr. Mullen recommends that 80 per cent be added retroactively and for the future he recommends new scales for the 148 Class I roads and 13 subsidiaries, the New England lines, and separately operated short lines less than 50 miles in length and from 50 to 100 miles in length.

Most of the Class I carriers had asked for an increase of 40 per cent in the rates for the transportation of mail, for which in 1926 they received a revenue of $96,326,466, and the other roads had asked for varying amounts of increase in relation to their individual condition.

After a consideration of various methods of estimating the increase which should be allowed by cost studies on various bases as to which there were many differences between the railways and the Post Office Department, the report says that the necessity for such an increase as 40 per cent has not been shown but that after a consideration of the various bases and after "making allowances for weakness of theories and methods," an increase of 15 per cent is justified.

The proposed new scale for Class I roads begins with a rate of 39 cents for each mile of service of a 60-foot railway postoffice car, as compared with the present rate of 33.75 cents. The roads had asked for a rate of 47.25 cents. For the New England roads the corresponding rate proposed is 52.5 cents and for the short lines 73 cents for roads of 50 to 100 miles and 91 cents for roads under 50 miles.

Although argument in the case had been heard by the commission it re-opened the proceedings for the service of the proposed report and assigned it for further argument on June 29.

Some extracts from the report and the text of the conclusions are as follows:

### Extracts From Report

Application for reexamination of rates of pay for transportation of mail matter was filed May 9, 1925, by 198 carriers, including substantially all class I roads. On July 16, 1925, a similar application was filed by 87 short line railroads members of the American Short Line Railroad Association. Prior to the filing of the latter application, the commission had reopened the case on June 8, 1925, for reexamination with respect to rates of mail pay received by certain lines in New England upon application filed May 6, 1925. Applications had also been filed by other railroads. Upon representation by the Postmaster General that the proceeding should be broadened so as to include all roads carrying mail, the commission entered its order of July 24, 1925, reopening the proceeding as to all such roads, other than urban and interurban electric lines. Some 44 short line railroads in intermountain and Pacific coast territory, whose rates of mail pay were dealt with in separate proceedings, were excluded.

The case as presented is divided into four parts. First, rates of mail pay on 148 class I roads and 13 subsidiaries, represented by a Committee on Railway Mail Pay; second, rates of pay on 11 New England roads; third, rates of pay on 194 short lines, of which 172 are represented by the American Short Line Association, which also represents the Georgia & Florida, a class I road, and 19 by the mail pay committee; and fourth, proposals of the Post Office Department, with respect to grouping the carriers into mail pay groups, changes in the present space units and changes in regulations governing authorizations of space. Excluding the 11 New England lines, the total number of roads which furnished complete data, as classified by the Department, was 395, of which 209 were represented by the mail pay committee, 142 by the American Short Line Association, 2 by individual counsel, and 42 were not represented. 149 other roads, mostly short lines, either furnished no space or financial data or furnished incomplete data.

The rates of mail pay now in effect on lines of applicants, except New England lines, were fixed by the commission in *Railway Mail Pay*, 56 I. C. C. 1, decided December 23, 1919. The space and other data in that case were obtained during a test period of 35 days in 1917. Rates were fixed for the period November 1, 1916 to January 1, 1918. These were increased 25 per cent effective the latter date.

### Estimates of Volume of Mail

The mail pay committee submitted testimony and exhibits to show that the volume and weight of mail transported and the average loading in the several units of space have greatly increased; and that the rates do not make proper allowance therefor, nor for the greater trucking and handling services at terminals. To determine the actual weight of mails transported would involve considerable expense on the part of the Department and the carriers. It was, therefore, agreed by the parties, for the purposes of this case, that the weight of the mails for the year ended June 30, 1923, as reported to Congress by the Department in its cost ascertainment, published in Senate document 162, Sixty-eighth Congress, with an additional allowance of 15 per cent for the weight of sacks, pouches and other mail containers, would be accepted as evidence of the increased weight of the mails in 1923 compared with 1917, and that a further allowance for the year 1924 might be made based upon a fair consideration of the increases in postal revenues. In 1917, the ton-miles of mail transported were 826,090,715 computed from weights obtained during the test period in that year. The total weight of all mail matter handled by the Department for the year ended June 30, 1923, computed from data obtained during a test period, was 2,879,700 tons. The ton miles totaled 1,211,055,166. Parcel post matter constituted 62.4 per cent of the weight and 54 per cent of the ton-miles of service. Addition of weight of mail containers upon the basis agreed upon brings the totals to 3,311,655 tons and 1,392,713,441 ton-miles. The latter amount is about 168 per cent of the ton-miles of mail transported in 1917.

The business of the Department, as measured by postal revenues, increased 7.53 per cent in the fiscal year ended June 30, 1924. On the assumption that the increase in revenue reflects the increase in volume, the carriers estimate that the ton-miles of mail and containers handled in the fiscal year 1924 were 1,497,584,563.

This figure is too large, as pointed out by the Department, because the increase in postal revenues includes revenues resulting from increased postal rates, from money order fees, C. O. D. fees, and from other sources not related to transportation of the mails.

In 1926, as estimated by the Department, the ton-miles of mail handled were 1,376,711,341. The amount for 1926 is

computed from certain test weighings made by the Department in the larger post-offices in connection with its cost ascertainment for that year. To the estimated ton-miles for 1926 the carriers add 15 per cent for weight of mail containers and obtain a figure of 1,583,218,050 total ton-miles for 1926, an increase of about 91 per cent over 1917.

Payment to the railroads for mail service in 1917 totaled $74,165,246 under the rates established by Congress; under the higher rates established in the original decision in the *Mail Pay Case, supra,* the payments amounted to $78,132,000. In 1926, payments amounted to $96,326,466. Part of this increase is due to the increase in rates amounting to 25 per cent effective January 1, 1918. The increase in revenue due to increase in volume of mail is estimated at approximately 4 per cent. The carriers contend that the great increase in volume of mail transported by them has not been reflected in their mail revenue because of changes in the character of authorizations and because of heavier loading.

The total volume of mail transported by the carriers has undoubtedly increased, but the total amount of service rendered expressed in units of 60-foot car-miles has decreased. The annual 60-foot car-miles of service authorized by the Department as of March 27, 1917, were 252,195,307. For the year 1925, the corresponding figure, including emergency service, was 249,296,791, a decrease of 1.14 per cent. The decrease has been effected by substantially decreasing authorizations of space in 60-foot and 30-foot apartment railway post-office cars, increasing authorizations in 15-foot railway post-office apartments, lesser storage units and closed-pouch units, and by heavier loading. This has resulted in a decrease in mail revenue per ton-mile on all class I roads from 9 cents in 1917 to 6.1 cents in 1926, according to estimates made by the carriers, based upon the computed weights of all mail handled by the Department.

## Carloading Increased

The increase in loading is indicated by the estimated tons of mail per authorized 60-foot car-mile, which in 1917 amounted to 3.27 and in 1926 amounted to 6.28. an increase of 3.11 tons. Of this increase, .75 ton is attributed to the change in authorization from railway post-office units to storage units, and the remainder of 2.36 tons is attributed to heavier loading. From this, the carriers argue that the loading per 60-foot car has been increased about 70 per cent.

Comparing railroad costs of operation generally in 1926 with those in 1917, the carriers introduced charts indicating that operating expenses, taxes and 5.75 per cent return on investment per train-mile together were 60 per cent higher than the corresponding figure for 1917; that operating expenses and taxes per train-mile were 70 per cent higher; and wages per hour about 100 per cent higher; and that rates of mail pay were but 25 per cent higher.

In order to determine the cost to the carriers of transporting the mails and the amount of their investment devoted to the mail service, a cost study was made upon the basis of operations for the calendar year 1925. As a result of this study, the carriers contend that an increase of at least 40 per cent in mail revenue is necessary to pay the cost of service and return 5.75 per cent upon the investment.

The present and proposed rates for the several units of space are as follows:

| Unit | Present rate per mile cents | Proposed rate per mile cents |
|---|---|---|
| Railway post-office cars | | |
| 60-foot | 33.75 | 47.25 |
| 30-foot apartment | 18.75 | 26.25 |
| 15-foot apartment | 12.50 | 17.50 |
| Storage cars | | |
| 70 feet | 40.833 | 57.167 |
| 60 feet | 35.00 | 49.00 |
| 30 feet | 18.75 | 26.25 |
| 15 feet | 10.00 | 14.00 |
| 7 feet | 5.625 | 7.875 |
| 3 feet | 3.125 | 4.375 |
| Closed pouch | | |
| 15 feet | 12.50 | 17.50 |
| 7 feet | 6.25 | 8.75 |
| 3 feet | 3.75 | 5.25 |

The carriers made a comparison of the total property investment accounts used by them in their exhibits with a tentative valuation adjusted for class I roads based upon the tentative valuation made by the commission in 1920 in the increased rate case of that year, plus subsequent additions and betterments. According to this comparison, the tentative valuation in 1925 would be 94.476 per cent of the total property investment accounts including cash, materials and supplies. The investment shown in the exhibits in the instant proceeding is reduced accordingly and the resultant amount is considered as adjusted to the tentative valuation. On this basis the increase in mail revenue necessary to pay expenses and a return of 5.75 per cent on investment is shown as 39.98 per cent as compared with 41.53 per cent based upon the property investment accounts.

The carriers point out that the several bases used by them for allocating and apportioning the space data of the test period and for determining the amount of investment, indicate that increases in mail revenue should be made ranging from 39.98 per cent to 43.56 per cent. Whichever basis is used, the carriers claim that an increase of at least 40 per cent is necessary.

The necessity for such an increase has not been shown. In connection with the cost studies under any of the plans for dividing the train space, it should be borne in mind that in computations of this character where the direct allocations are relatively small and the great bulk of expenses and investment are necessarily divided, subdivided, apportioned and reapportioned upon various theories and assumptions, the results cannot be confidently accepted at face value, but must be discounted in some reasonable measure.

Other means of testing the accuracy of the results may be employed in determining what increase in mail revenues, if any, has been justified.

Giving consideration to the preceding figures as well as to those based upon the respective cost studies; to the fact that none of these figures except those in the carriers' exhibits, includes any charge against the passenger-train service for its proportion of the cost of handling non-revenue freight; giving special weight to the figures based on the plan for the division of train space followed in the original proceeding and subsequent reexaminations; and making allowance for weaknesses of theories and methods, an increase of 15 per cent in mail revenues for the carriers as a whole in this group is justified.

## Conclusions

The commission should find:

1. That the rates of pay for transportation of mail matter by railway common carriers subject to the act of July 28, 1916, except those included in the decisions entered in this proceeding noted in the margin[1], are not fair and reasonable; that they were not fair and reasonable on and after the dates the carriers filed applications for reexamination, or where applications were not filed, on and after July 24, 1925, the date this proceeding was reopened for reexamination.

2. That the fair and reasonable compensation to be received by said carriers from said dates to July 15, 1928, is 15 per cent in addition to the compensation paid or accrued at the established rates in effect during said periods, except that the fair and reasonable compensation to be received by separately operated railroads not exceeding 100 miles in length, is 80 per cent in addition to the compensation paid or accrued at the established rates for such roads.

3. That the fair and reasonable rates of pay to be received on and after July 15, 1928 by the carriers in this proceeding, except those included in paragraphs 4 and 5 hereof, are as follows:

| For each mile of service by a: | Cents |
|---|---|
| 60-foot R.P.O. car | 39.0 |
| 30-foot apartment car | 21.5 |
| 15-foot apartment car | 14.5 |
| 70-foot storage car | 47.0 |
| 60-foot storage car | 40.5 |
| 30-foot storage space | 21.5 |
| 15-foot storage space | 11.5 |
| 7-foot storage space | 6.5 |
| 3-foot storage space | 3.5 |
| 15-foot closed-pouch space | 14.5 |
| 7-foot closed-pouch space | 7.0 |
| 3-foot closed-pouch space | 4.5 |

*Provided,* That the minimum payment on any mail route, over any part of which mail is transported not less than six days a week, shall be $72 per mile per annum.

4. That the fair and reasonable rates of pay to be received on and after July 15, 1928, by the Bangor & Aroostook Railroad Company, Boston & Albany Railroad (New York Central Railroad Company, lessee), Boston & Maine Railroad, Central New England Railway Company, Central Vermont Railway Company, Maine Central Railroad Company, Montpelier & Wells River Railroad, The New York, New Haven & Hartford Railroad Company, Rutland Railroad Company, St. Johnsbury & Lake Champlain Railroad Company, York Harbor and Beach Railroad Company, Canadian Pacific Railway (Wells River, Vt. to Derby, Vt.) and Canadian National Railway

[1] 123 I. C. C. 33; 120 I. C. C. 439; 112 I. C. C. 151; 109 I. C. C. 13 (not including Canadian National Railway, Grand Trunk New England Lines); and 95 I. C. C. 493.

Company (Grand Trunk New England Lines), are as follows:

| For each mile of service by a | Cents |
|---|---|
| 60-foot R.P.O. car | 52.5 |
| 30-foot apartment car | 29.5 |
| 15-foot apartment car | 19.5 |
| 70-foot storage car | 63.5 |
| 60-foot storage car | 54.0 |
| 30-foot storage space | 29.5 |
| 15-foot storage space | 15.5 |
| 7-foot storage space | 8.5 |
| 3-foot storage space | 4.5 |
| 15-foot closed-pouch space | 19.5 |
| 7-foot closed-pouch space | 10.0 |
| 3-foot closed-pouch space | 6.0 |

*Provided,* That the minimum payment on any mail route, over any part of which mail is transported not less than six days a week, shall be $97 per mile per annum.

5. That the fair and reasonable rates of pay to be received on and after July 15, 1928, by: (a), separately operated railroads not exceeding 100 miles in length, and not less than 50 miles in length, and (b), separately operated railroads less than 50 miles in length, are as follows:

| For each mile of service by a: | (a) Separately operated railroads 50 to 100 miles in length Cents | (b) Separately operated railroads less than 50 miles in length Cents |
|---|---|---|
| 60-foot R.P.O. car | 73.0 | 91.0 |
| 30-foot apartment car | 40.5 | 50.5 |
| 15-foot apartment car | 27.0 | 34.0 |
| 70-foot storage car | 88.0 | 110.5 |
| 60-foot storage car | 75.5 | 94.5 |
| 30-foot storage space | 40.5 | 50.5 |
| 15-foot storage space | 21.5 | 27.0 |
| 7-foot storage space | 12.0 | 15.0 |
| 3-foot storage space | 7.0 | 8.5 |
| 15-foot closed-pouch space | 27.0 | 34.0 |
| 7-foot closed-pouch space | 13.5 | 17.0 |
| 3-foot closed-pouch space | 8.0 | 10.0 |

*Provided,* That the minimum payment on any mail route, over any part of which mail is transported not less than six days a week, shall be $112.50 per mile per annum.

6. That section 4 of the order, entered December 23, 1919, *Railway Mail Pay, supra,* with respect to computing the miles of service of a storage car or lesser unit should be changed to read as follows:

In computing the miles of service of a storage car or lesser storage unit, the maximum space authorized in either direction of a round-trip car run shall be regarded as the space to be computed in both directions unless any part of the car containing such unit be used by the railroad company in the return movement.

7. That section 8 of the said order, as amended, should be changed to read as follows:

Whenever a regular authorization is exceeded on more than 50 per cent of the trips in any calendar month, the appropriate higher unit shall be authorized. A regular authorization may be reduced to the appropriate lower unit which would have accommodated the mails on more than 50 per cent of the trips in any calendar month. This rule will not apply to the month of December.

8. That the provisions of the order of December 23, 1919, as amended, except as modified herein, shall remain in full force and effect.

# Decreased Car Loading Estimated

REVENUE freight car loading for the 52 weeks of 1928 is estimated at 50,434,000 cars in a report submitted by the Car Service Division of the American Railway Association to the board of directors at a meeting at Atlantic City on June 14. This represents a decrease of 1,280,302 cars as compared with the loading for 1927 and a decrease of 2,664,819 cars as compared with 1926.

For the first 22 weeks of this year car loading has amounted to 20,468,015 cars, a decrease of 968,681 cars, or 4.5 per cent, as compared with the loading in the corresponding period of 1927 and a decrease of 655,100 cars as compared with 1926.

Preparations are being made by the railroads to meet an anticipated heavy crop movement late this summer and fall, according to the report.

### Winter Crop Conditions

"Winter crop conditions this year", said the report, "are different from usual. The area of so-called soft winter wheat production, extending from Missouri east and north of the Ohio river has suffered very heavy abandonment, and present prospects indicate only about half the crop of last year. In the so-called hard winter wheat area, which includes the belt from Texas north to Montana, west of the Missouri River, there is a mixed situation. From the middle of Kansas south, which is the area of heaviest production, conditions are good and indicate an increase over last year of about 35 per cent. North and west of the middle of Kansas the prospects are less favorable. Nebraska and Colorado showing an estimated decrease of from 25 to 35 per cent under last year, with Montana about the same.

"These conditions necessarily will concentrate the heavy crop movement within a limited area. While the indications in the Kansas-Oklahoma territory are considerably below the large production of 1926, there has been a radical change in harvesting methods since last year. In 1927 there was an increase in this district of approximately 60 per cent in the number of 'combine' harvester-thresher machines over 1926, and the number is being further increased to a considerable degree this year. With a much smaller number of 'combines' in operation, the heavy crop movement of 1926 was dumped on local elevators and railroads so fast as to tax their facilities to the utmost. In some cases it was utterly impossible to keep up with the avalanche of grain that poured from the harvesters seeking room in elevators and cars.

"The probable combination this year of another heavy crop with a further marked increase in 'combines' in operation, and the possible conjunction of a favorable market price (owing to reductions in production elsewhere) will produce a situation that will require the best efforts of the roads serving this territory to meet successfully.

### Building Up Reserve

"The attention of all railroads throughout the country has been called to this impending crop movement and the necessary action is being taken to build up the box car supply of the southwestern lines accordingly.

"The Shippers' Advisory Boards in the wheat territory are preparing to co-operate closely with the railroads as in the past in every way that will contribute to the prompt handling of cars engaged in this traffic."

In respect to the open top car situation, the Car Service Division reported that the supply of this type of equipment will be adequate to protect promptly all requirements for such cars, regardless of any bunching of shipments which may be produced as a result of the late spring or other unforeseen or unusual causes.

Production of bituminous coal, according to the report, for the calendar year to May 12 totaled 176,752,000 tons, a decrease of 42,260,000 tons compared with the same period in 1927. Consumers' stocks of bituminous coal in reserve decreased 26,700,000 tons or 35.6 per cent compared with the same date the previous year. Notwithstanding the large decrease, the coal in storage represented practically the normal situation. Dumping of coal into vessels at Lake Erie Ports for the period from January 1 to May 13 were the lightest for any similar period during the past four years.

The car supply continues to be adequate and the condition of equipment is good.

# Railway Purchases of Supplies and Equipment in 1927

*Expenditures exceed billion and a quarter dollars, though less than in previous year*

CLASS I railways of the United States spent $1,395,928,000 for material and supplies during 1927, according to compilations of the Bureau of Railway Economics from special reports of the carriers. This was the money spent directly for material and supplies and does not include large expenditures for commodities used in new equipment and construction provided by contractors and builders. The expenditures represent a decrease of $163,104,000 or 10.5 per cent from those of 1926. This is in large part attributed to a reduction from three to five per cent in railway traffic, four per cent in railway revenues and more than two per cent in operating expenses. The purchases are given in Tables 1, 2, and 3, where comparisons with purchases in previous years and the percentage of each expenditure to the aggregate are also afforded.

**Table 1.—Purchases by Class I Roads in 1927***

| Item | Cost | Percent To Total |
|---|---|---|
| Fuel: | | |
| Bituminous coal | $346,814,000 | 24.84 |
| Anthracite coal | 8,159,000 | .58 |
| Fuel oil | 78,472,000 | 5.62 |
| All other | 5,876,000 | .39 |
| Total fuel | $438,821,000 | 31.4 |
| Forest Products: | | |
| Cross ties (treated and untreated) | $108,215,000 | 7.75 |
| Switch and bridge ties (treated and untreated) | 12,127,000 | .89 |
| Timber and lumber | 48,187,000 | 3.45 |
| Other forest products | 7,200,000 | .52 |
| Total forest products | $175,729,000 | 12.6 |
| Iron and Steel Products: | | |
| Steel rail (new and second hand, except scrap) | $101,567,000 | 7.28 |
| Wheels, axles and tires | 47,435,000 | 3.40 |
| Frogs, switches, crossings, track fastenings and bolts, spikes, tie plates, rail anchors, etc. | 72,032,000 | 5.16 |
| Iron bridges, turn tables, structural steel, bar iron, and steel, forgings, fabricated and unfabricated shapes and pressed steel parts | 51,267,000 | 3.67 |
| Flues and tubes for locomotives and stationary boilers | 8,191,000 | .59 |
| Telegraph and telephone, interlocking and signal material | 25,300,000 | 1.81 |
| Bolts, nuts, washers, rivets, springs, etc. | 19,064,000 | 1.37 |
| Locomotive and car castings, beams, couplers, frames and car roofs | 62,294,000 | 4.46 |
| Machinery, boilers, repair parts and all other iron and steel products | 45,454,000 | 3.25 |
| Total iron and steel products | $432,604,000 | 31.0 |
| Miscellaneous: | | |
| Cement | $5,811,000 | .42 |
| Lubricating oils and grease; illuminating oils, boiler compound; waste | 23,280,000 | 1.67 |
| Metal and metal products | 55,668,000 | 3.99 |
| Ballast | 23,965,000 | 1.72 |
| Air brake material and appliances for locomotives | 24,371,000 | 1.74 |
| All electrical materials | 22,753,000 | 1.63 |
| Stationery and printing | 26,840,000 | 1.92 |
| Commissary supplies for dining cars and restaurants | 27,425,000 | 1.96 |
| Rubber and leather goods | 9,900,000 | .71 |
| Painters' supplies and chemicals | 35,399,000 | 2.54 |
| Automotive equipment and supplies | 2,035,000 | .15 |
| Train and station supplies and all other miscellaneous purchases | 91,327,000 | 6.54 |
| Total miscellaneous | $348,774,000 | 25.0 |
| Grand Total | $1,395,928,000 | 100.0 |

* Values include freight and handling charges.

The expenditure for fuel during 1927 was $438,821,000, a reduction of 7.3 per cent from 1926. Bituminous coal cost $346,814,000 in 1927, anthracite coal $8,159,000 and fuel oil $78,472,000. The purchases amounted to 130,190,000 net tons of bituminous coal, 3,199,000 net tons of anthracite and 2,765,259,000 gal. of fuel oil. This was 25.0 per cent of the bituminous coal produced in 1927, compared with 24.4 per cent in 1926 and 4.0 per cent of the anthracite output as compared with 4.4 per cent in 1926. The railways took between 20 and 25 per cent of the production of fuel oil in 1927.

Direct purchases of forest products amounted to $175,729,000 in 1927, which was 5.7 per cent under 1926. The cross ties purchased amounted to 97,135,000, costing $108,215,000. The number increased 3.6 per cent, while the cost increased 7.0 per cent. More cross ties were purchased during 1927 than in any year since 1924. There were 326,735,000 bd. ft. of switch and bridge ties bought, while the total timber and lumber purchases amounted to 1,285,289,000 bd. ft. The purchase of forest products represented 17.4 per cent of the country's total output, compared with 17.1 per cent in 1926 while the total consumption of forest products, including the lumber acquired indirectly as well as directly, is estimated to represent more than 25 per cent of last year's production.

**Table 2.—Purchases by Class I Roads, 1924-1927**

| Item | 1924 | 1925 | 1926 | 1927 |
|---|---|---|---|---|
| Fuel | $471,656,000 | $459,465,000 | $473,354,000 | $438,821,000 |
| Forest Products | 180,872,000 | 170,305,000 | 186,291,000 | 175,729,000 |
| Iron and Steel Products | 365,610,000 | 419,255,000 | 507,302,000 | 432,604,000 |
| Miscellaneous | 324,917,000 | 343,018,000 | 392,085,000 | 348,774,000 |
| Grand Total | $1,343,055,000 | $1,392,043,000 | $1,559,032,000 | $1,395,928,000 |

The total of $432,604,000 spent in 1927 for iron and steel products was 14.7 per cent less than in 1926 but greater than the purchases in 1924 and 1925. The purchases of steel rail amounted to $101,567,000 and comprised 2,278,000 gross tons. This tonnage was greater than in any recent year with the exception of 1926.

The outlay for wheels, axles and ties was $47,435,000 in 1927, that of frogs, switches, crossings, track fastenings, bolts and spikes $72,032,000, that for iron bridges, turn tables, structural steel, etc., $51,267,000 and the purchases of flues and tubes for locomotives and stationary boilers, $8,191,000.

It is estimated that the railways bought 19 per cent of the iron and steel output in 1927, the percentage taken by the railways of each form of steel distributed being estimated as follows: rails 86.7 per cent; track accessories 93.7 per cent; plates 23.8 per cent; shapes 10.7 per cent; bars 9.2 per cent; sheets 7.0 per cent; tin plate 3.5 per cent; wire products 3.5 per cent; pipes and tubes 1.7 per cent; hoop bands, etc., 3.0 per cent; strip steel 1.9 per cent; and all other 46.6 per cent.

The expenditures for cement were $5,811,000, in 1927, a decrease of 16.7 per cent from 1926, the number of barrels purchased in 1927 being 2,673,000, or about 1.5 per cent of the total produced, and the total purchases of lubricating oils and grease, illuminating oils, boiler compound and waste, was $23,280,000, a decrease of 13.8 per cent from 1926. The expenditures

for brass, copper, zinc, lead, etc., were $55,668,000, or 8.8 per cent less than in 1926. Of 834,050 net tons of copper produced in the United States in 1927 it is estimated that 4,500 tons were purchased for railway cars; 1,600 tons for air brakes and 750 tons for steam railway electrifications.

**Table 3.—Quantities Purchased 1924-1927**

| Item | 1924 | 1925 | 1926 | 1927 |
|---|---|---|---|---|
| Fuel: | | | | |
| Bituminous coal, net tons | 126,372,000 | 129,325,000 | 140,084,000 | 130,190,000 |
| Anthracite coal, net tons | 4,673,000 | 3,780,000 | 3,678,000 | 3,199,000 |
| Fuel oil, gals. | 2,848,550,000 | 3,043,783,000 | 3,058,916,000 | 2,765,259,000 |
| Forest Products: | | | | |
| Cross ties, units | 98,130,000 | 87,965,000 | 93,760,000 | 97,135,000 |
| Switch and bridge ties, bd. ft. | 329,040,000 | 306,444,000 | 365,957,000 | 326,735,000 |
| Timber and lumber, bd. ft. | 1,296,430,000 | 1,416,111,000 | 1,580,767,000 | 1,285,289,000 |
| Iron and Steel Products: | | | | |
| Steel rail, gross tons | 1,779,000 | 2,179,000 | 2,504,000 | 2,278,000 |
| Miscellaneous: | | | | |
| Cement, bbls. | 2,211,000 | 2,104,000 | 3,127,000 | 2,673,000 |
| Ballast, cu. yds. | 14,265,000 | 21,673,000 | 25,422,000 | 28,430,000 |

Approximately 28,430,000 cu. yd. of ballast costing $23,965,000 were purchased in 1927 by the railways, which was an increase of 11.8 per cent over 1926.

## Capital Expenditures for 1928

The Bureau has supplemented the statistics of railway purchases for 1927 with comparisons of the capital expenditures for the three months ending March 31, 1928, with the corresponding period of last year. The values are shown in part in Table 4. The capital expenditures for new equipment, and for additions and betterments to property used in connection with the transportation service, amounted to $128,428,000 in the first three months of 1928, a decrease of $26,594,000 from the corresponding period of 1927 and $37,327,000 under 1926.

**Table 4.—Capital Expenditures, First Quarter 1928**

| Item | Total authorized incl. carry over from 1927 | Amount spent | Carry-over to second quarter | Expenditures first quarter 1927 |
|---|---|---|---|---|
| Equipment: | | | | |
| Locomotives | $35,073,000 | $10,493,000 | $24,580,000 | $19,771,000 |
| Freight train cars | 83,225,000 | 13,601,000 | 69,624,000 | 18,192,000 |
| Passenger train cars | 44,311,000 | 5,785,000 | 38,526,000 | 12,346,000 |
| Other equipment | 13,228,000 | 3,137,000 | 10,091,000 | 5,037,000 |
| Total | $175,837,000 | $33,016,000 | $142,821,000 | $55,346,000 |
| Roadway and Structures | | | | |
| Additional track * | $114,311,000 | $24,744,000 | $89,567,000 | $30,145,000 |
| Heavier rail | 33,349,000 | 9,621,000 | 23,728,000 | 8,275,000 |
| Additional ballast | 12,160,000 | 1,922,000 | 10,238,000 | 1,540,000 |
| Shops and engine houses† | 25,593,000 | 7,964,000 | 17,629,000 | 10,941,000 |
| All other improvements | 232,507,000 | 51,161,000 | 181,346,000 | 48,775,000 |
| Total | $417,920,000 | $95,412,000 | $322,508,000 | $99,676,000 |
| Grand Total | $593,757,000 | $128,428,000 | $465,329,000 | $155,022,000 |

* Includes rail and tie fastenings and other track material.
† Includes machinery and tools.

Total expenditures authorized to April 1, including those carried over from 1927, amounted to $593,757,000, compared with $724,853,000 for the same period in 1927, and $821,880,000 in 1926. The decrease in authorizations for this year is due principally to the smaller authorized expenditures carried over from the previous year. Those carried over for 1928 amounted to $323,692,000, compared with $455,828,000 for 1927 and $467,057,000 for 1926. The authorization for expenditures made between January 1, and April 1, this year compare more favorably with those for 1927, being $270,065,000 for 1928 and $269,025,000 for 1927. The capital expenditures for the past five years are:

| | |
|---|---|
| 1923 | $1,059,149,000 |
| 1924 | 874,743,000 |
| 1925 | 748,191,000 |
| 1926 | 885,086,000 |
| 1927 | 771,552,000 |
| Total | $4,338,721,000 |

The expenditures during the first three months of 1928 devoted to purchase of new equipment were $33,016,000, compared with $55,346,000 for the corresponding period of 1927, while those for roadway and structures aggregated $95,412,000, as compared with $99,676,000 in 1927. Capital expenditures actually made in the first three months this year for locomotives amounted to $10,493,000, as compared to $19,771,000 during the corresponding period of last year, expenditures for freight cars $13,601,000 as compared with $18,192,000 in the first quarter of 1927, while capital expenditures for passenger cars in the first three months this year amounted to $5,785,000, compared with $12,346,000 for 1927.

Total capital expenditures for roadway and structures in the first three months this year were a decrease of $4,264,000 from those of the same period last year. Capital expenditures for additional track in the first three months amounted to $24,744,000, compared with $30,145,000 during the corresponding period last year. Expenditures for heavier rail totaled $9,621,000 compared with $8,275,000 in 1927, those for shops and engine houses, including machinery and tools, $7,964,000 as compared with $10,941,000 in 1927, while $53,083,000 were expended in the first quarter this year for all other improvements, which is an increase of approximately $3,000,000 over the expenditures of the same period in 1927. Those for roadway and structures aggregated $95,412,000 as compared with $99,676,000 in the first quarter of 1927.

The decrease of equipment expenditures this year is in line with smaller equipment orders and installations. The number of locomotives on order January 1, 1928, was 93, compared with 329 the year before and the number of freight train cars on order 12,431 as compared with 18,481 the year before, while unfilled orders of passenger train cars decreased from 730 on January, 1, 1927, to 364 for 1928. The orders placed since January 1, for passenger cars and locomotives show an increase over 1927 while installations of passenger cars during the first quarter of 1928 were also greater than in 1927, locomotive installations remaining about the same.

# Report on Danville, Ky., Accident

ON April 10, 1928, there was a rear-end collision between a passenger train and a light engine on the Southern at Danville, Ky., resulting in the death of 1 employee and the injury of 17 passengers, 3 employees, 2 Pullman porters and 1 dining car employee. An abstract of the report of the Bureau of Safety of the Interstate Commerce Commission covering this accident follows:

This accident occurred on a double-track line over which trains are operated by time-table train orders and an automatic block-signal and automatic train-control system. The accident occurred within yard limits at Danville, at the south end of what is known as the north yard. At a point 18 ft. south of this main-track switch, there is another switch, the north switch of a crossover, which connects the two main tracks.

The signals involved are northbound signals 1172 and 1176, located 557 and 2,430 ft., respectively, south of the lead-track switch. Signal 1172 operates in the stop and caution positions only. Signal 1176 is of the three-position, upper-quadrant, semaphore type. The automatic train-control device is of the intermittent inductive type, known as the auto-manual automatic stop.

At the time of the accident, light engine 1307, headed north, stood on the lead track. Work extra 6272, consisting of engine 6272, six cars and a caboose, headed north, stood on the southbound main track, opposite signal 1172, the engine being about one hundred feet south of the south crossover switch and the caboose about one hundred feet south of the signal. The weather was clear at the time of the accident, which occurred at about 5:15 p.m.

Northbound passenger train No. 42 passed signal 1176, which was displaying a clear indication, passed signal 1172, the indication of which is in question, entered the main-track switch leading to the south end of the north yard, this switch having just previously been opened by the head brakeman of work extra 6272, and struck the rear end of the tender of light engine 1307, while traveling at a speed variously estimated to have been from 20 to 40 miles per hour. With the exception of the rear truck of the combination car, none of the equipment of train No. 42 was derailed. The employee killed was a hostler helper on engine 1307.

The head brakeman of work extra 6272 stated that when his train left Danville he remained there with instructions to flag all trains until the return of his train. When he saw the work train returning to Danville, the brakeman called the yardmaster by telephone and received instructions to put the work train on the coal track in the north yard; nothing was said about train No. 42 and he did not tell the yardmaster his train was on the southbound track. He immediately left the telephone booth and walked about 50 ft. to the switch connecting the northbound main track with the lead track and opened it, then he walked to the north switch of the crossover, 18 ft. south, and opened that switch, after which he started toward the south switch of the crossover, intending to open that switch. After reaching a point about thirty feet south of the north switch of the crossover, he saw train No 42 approaching, at which time he said it was north of signal 1172. The brakeman immediately started running north between the rails of the southbound main track, in an attempt to reach and close the switch leading from the northbound main track to the lead track; but train No. 42 passed him, and then the accident occurred.

## Conclusions

The accident was caused by a switch being opened directly in front of train No. 42, for which the brakeman of work extra 6272 is responsible.

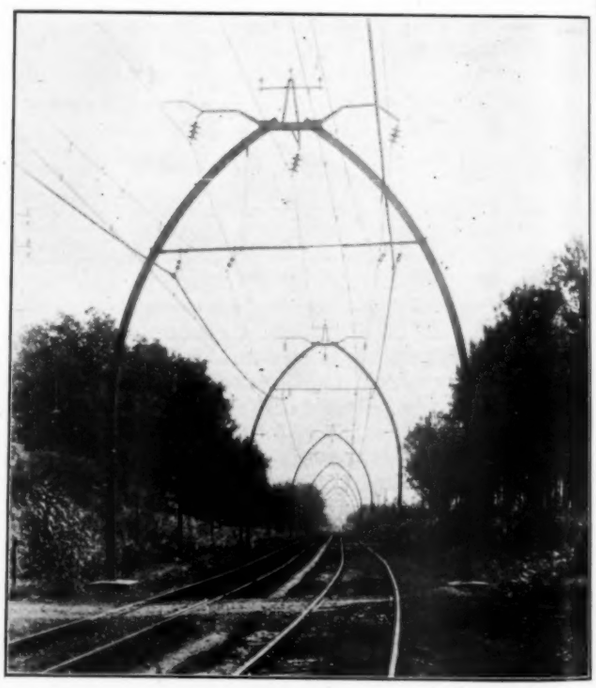
Train No. 42 was due at Danville at 5:10 p.m., and at the time the switch was opened it was already overdue at that point. Under the rules, the work extra was required to clear the time of train No. 42, a first-class superior train, and the brakeman should not have opened the switches in preparation for the movement of the work extra from the southbound track to the northbound main track and thence to the yard, without first knowing either that train No. 42 had passed or that his train had been given additional time on train No. 42. This brakeman had had about five years' experience and was fully aware of these requirements, but he failed to conform to them, as he admitted that he entirely overlooked train No. 42. Because of his action in this instance, he is directly responsible for this accident.

This accident occurred on a line equipped with automatic block signals and an automatic train-control device, and it was an accident of a type which these devices are designed to prevent. Signal 1172 displays only caution and stop indications and the automatic stop inductor installed in connection therewith is so arranged that an automatic operation of the brakes will occur whenever an equipped engine passes it, regardless of the indication of the signal, unless the forestalling device is operated by the engineman.

There is conflicting evidence as to the indication of signal 1172 at the time train No. 42 actually passed it. It is clearly shown to have been in caution position at the time train No. 42 approached it and according to the statements of the engineman and fireman of train No. 42, it was in caution position the last time they saw it just before passing it. The conductor of the work extra was watching train No. 42 as it passed and saw the signal change from caution to stop just as the engine passed under it.

Had the switch been opened more than five or six seconds before train No. 42 passed signal 1172, that signal would have displayed a stop indication, which under the rules would have required the train to stop before passing it. Had this signal been in stop position for train No. 42, this train probably could have been stopped before reaching the open switch, either by the operation of the automatic train stop, if the engineman did not forestall, or by operation of the brakes by the engineman. With the signal in the caution position, however, the engineman, after acknowledging the signal indication and thereby forestalling the automatic application of the brakes, was permitted to proceed to the next signal prepared to stop. From the evidence in this case, it is believed that the switch was opened just as or immediately after train No. 42 passed signal 1172, the last indication point. The signal, therefore, gave no indication, before train No. 42 passed it, of the dangerous condition which was created by the opening of the switch only a short distance ahead, and there was, under the circumstances, no opportunity for the train stop device to perform its intended function. Both the signal and the train stop device were found, upon test, to be operative as intended.

* * *



**Overhead Structure Carrying 10,000 and 60,000 Volt Power Lines and 1500 Volt Contact Wire, Southern Railway (France)**

# Reading To Use Triple-Unit, Gas-Electric Rail Car

*Three 124-horse power engines require little space and insure dependable power*

By N. L. Freeman

Railway Equipment Engineering Department, Westinghouse Electric & Manufacturing Company

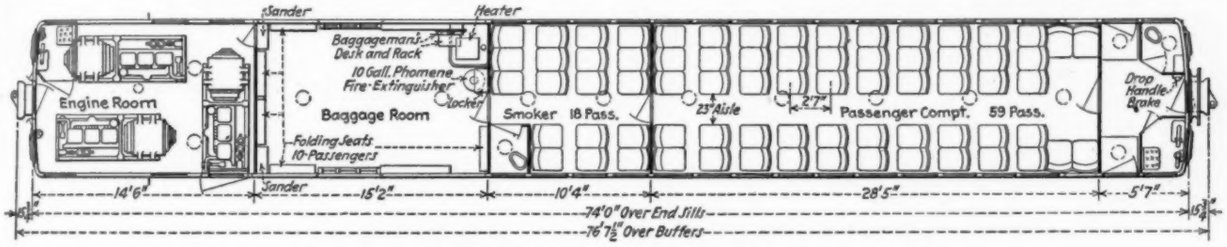
THE first triple-power-plant gas-electric rail car has been completed and tested satisfactorily. It was built for the Reading Company by the Mack International Motor Company, Plainfield, N. J. It is the builder's model AR car and while it is one of a line of three models of rail cars it is the first one ever equipped with this combination of three power plants.

In developing the triple-power-plant Mack rail car, the International Motor Company continued its policy of using a standard power unit and varying the number of power units according to the service application. By this arrangement, a single stock power unit equipment provides for all applications. In addition a multiple power plant equipment is considered much better protection against car failure resulting from an engine failure and the feature of stopping an engine whenever desired is a matter of excellent economy. The power unit itself is easily removed, compact and accessible.

imately 60 tons. A space only 14 ft., 6 ins. long is required for the engine room. This is largely due to the compactness of the power unit, the length of which is 96 in. over-all. This leaves a large percentage of the body available for revenue service, as no valuable space is sacrificed in providing an operating compartment at each end for the double-end operation.

The passenger compartment is equipped with well spaced bus type seats. The main compartment has seats deeply upholstered with plush, while leather is used for that purpose in the smoking compartment. These seats are shock insulated from their floor mounting, which also makes them more flexible and yielding to an occupant's weight. This comfortable arrangement, accompanied by generous lighting, gives the passenger compartments a parlor car aspect.

The car is heated by a pressure-hot water system. The heater is located in the baggage compartment and




**Arrangement of the Reading Triple-Unit Gas-Electric Rail Car**

In such a multiple power plant arrangement it was found desirable to arrange the equipment so that it could be controlled remotely and be multiplied with other cars. The Reading triple-unit car is arranged for operation from a trailer as well as from either end of the motor car. This feature is incorporated in the control scheme.

In addition to the multiplying arrangement there are three automatic features. The first is the automatic battery-charging from the main generator during engine idling, which fully protects the battery from an over-voltage from the main generator at all times. The second is the automatic loading of the engine by its own ability to carry its load, this being independent of a condition such as the temperature of electrical or mechanical equipment and dependent wholly upon engine speed. The third is the automatic shunting of the traction motor fields at 37 miles per hour.

These power plants are so arranged that no blower motors are used in the dual cooling systems of each power unit. This is accomplished by utilizing the exhaust gasses through eductors and in turn diluting the gasses with a large quantity of air.

The car was built at the Paris, Ill., plant of the Cummings Car and Coach Company. The over-all length, buffer to buffer, is 76 ft. 7 ½ in. The weight is approx-

is arranged for connection to the engine cooling system without relieving the pressure on the radiators or putting pressure on the engines.

To add to the further comfort and safety of the passengers, the trucks are equipped with clasp brakes. The trucks are the cast steel two-axle equalized type built by the Commonwealth Steel Company. The forward truck carries two of the three traction motors, while the third motor is mounted on the forward axle of the rear truck. The car wheels are 36 in. in diameter and are mounted on A. E. R. A. E-10 axles which have 5½ x 10 in. journals and 7 in. motor bearings. The rear truck center is 11 ft. 8 in. from the rear end sill while the front truck is but 6 ft. 6 in. from the front end sill. This tends to give best weight distribution with the power units at the front of the car.

Each power unit consists of one Mack model AP engine, one Westinghouse type 180-A-4 generator, one control panel and set of control equipment, one 12 cu. ft. air compressor, and one charging generator all mounted on a light-weight bedplate.

Each power unit weighs approximately 5000 lb. without the control equipment and the expansion tank.

The prime mover is a standard Mack gasoline engine of the vertical, four-cycle, high-compression type designed for continuous duty. The design is such that

excellent economy is obtained over a wide range of engine speeds. It has six cast *en bloc* cylinders and uses three removable heads, large poppet intake and exhaust valves, one of each for a cylinder, arranged at one side of the block. The parts are primarily those used in the other Mack vehicles.

The engine, compressor, torque insulators and thermostatic control of cooling water and oil were described in detail in the April 14, 1928-issue of the *Railway Age*, page 866.

**General Dimensions of Mack AP Engine**

| | |
|---|---|
| Bore and stroke | 5 in x 6 in. |
| No. of cylinders | 6 |
| Piston displacement | 707 cu. in. |
| Governed speed | 1350 rpm. |
| Piston speed at governed speed | 1350 ft./min. |
| Horsepower at 1350 rpm. | 124 |
| Horsepower delivered to generator at 1350 rpm. | 120 |

## Generators and Motors

The generators are of special construction and designed around the characteristics of the engine. They are so built with proper speed and rating margins that the engines are correctly loaded for the entire operating range of the car. The particular features of the design are high efficiency, high ratings, engine cranking from generator and battery charging from the same source during idling periods. These machines are not equipped with exciters or differential fields for power output regulation. Instead, there are three fields; a battery tickler field, a high voltage shunt field and a series field for starting the engine and charging the battery. The tickler field is used at all times, the shunt field is used during power periods and is regulated externally, and the series field is used only during starting and charging periods.

The leads from each main generator are carried up to the small control cabinet mounted directly above the generator. During power periods each generator is connected through these panels to the Westinghouse Type 559-D-2 traction motors. There is no interconnection of generators or traction motors as each generator drives its own motor. The traction motors are also of special design for gas-electric cars. Their particular features are high efficiency, low speeds at the continuous rating together with high safe speeds, and the ability to efficiently take the full engine-generator output over the operating speed range of the car. The motor ratings are the same as those of the generator; that is, the Type 180-A-4 generator and the Type 559-D-2 motor are of balanced design. This removes a large part of the desirability of series-parallel operation and enables field shunting to be substituted without additional complication; high-speed loading is achieved as a direct result.

These traction motors incorporate a number of specific features. Among them is an arrangement of brushholders which reduces flashover tendency. This is accomplished by using four instead of two brushholders and locating those of like polarity at opposite points on the commutator. Bouncing of the armatures on crossings and rough track, which causes the majority of flashovers, is minimized as the points of contact are doubled and the tendency for the commutator to bounce clear of a brush will automatically compensate on the other brush of the same polarity.

The usual standard of waste-packed traction motor bearings and axle bearings is followed.

## Control

The method of controlling this combination of motor and generator is distinctly new in rail car service. The general method of handling the power circuits, starting the engines, etc., follows the usual gas-electric standard for Westinghouse equipment but the method of regulating the output is entirely new. It is built up on the fact that an engine's ability to accelerate under a given load is a direct indication of its ability to carry that load. Consequently the engine governor is equipped with a set of special contacts. The governor is set slightly in excess of 1350 rpm. and any tendency on its part to operate and close the throttle causes a pair of these contacts to close and any tendency of the governor to further open the throttle, as it would if the speed dropped below 1350 rpm., causes the other pair of contacts to close. This pair of operations controls a small motor and causes it to run in one direction or the other, depending on the contact established. This motor operates a rheostat in the shunt field circuit of the main generator and varies the loading placed on the engine by this generator. Thus it is seen that the engine actually loads itself for constant speed regardless of condition and will do so regardless of the temperature of the electrical equipment. This method of loading is the first application of this type of control. The regulating unit which includes the reversible motor drive, rheostat, and traction motor field shunt is the Westinghouse type UD-2 motor operated faceplate. It is a complete unit and is mounted above the generator and back of the control panel.

The control apparatus is of the standard Westinghouse 32-volt electro-pneumatic type. Several features are incorporated in this, including electro-pneumatic throttle control and electrically operated sanders. A special "link-in" feature permits overloading the engine when running as low as 1200 rpm. at 50 mph. This is an economical feature. The previously mentioned automatic field shunting and battery charging from the main generator are also noteworthy. The automatic field shunt is particularly helpful in protecting the equipment as well as further improving economy. The battery charging from the main generator is automatic. The battery is entirely protected against over-voltage by a relay across the terminals of the generator.

The main generator is not the only source of battery charge as there is a 750-watt charging generator on each power unit. By distributing the charge over running and idling periods it is possible to dispense with all lighting and charging regulators.

With the exception of sanders and control stations all control equipment is mounted on the power unit and is included as part of the removable power unit equipment feature. Knuckle joint connectors are provided for the main circuits to the power unit and a flat type jumper and receptacle for the control circuits in order that the electrical circuits may be disconnected easily in case a power unit is to be removed from the car.

The centralized control stations at each end of the car combine all of the control equipment including sanding, reversing, engine starting and stopping and car power control. They are of compact design and unusually accessible, using a number of parts in common with other control equipment on the car.

## The Trail Car

The trail car built for operation with either the Mack triple power plant rail car or a Brill double power plant rail car is also of novel construction. One end is equipped with a Westinghouse-Mack control station and the other with a Westinghouse-Brill control station. Suitable jumpers and receptacles are provided for carrying control circuits between motor car and trailer.

# Boston & Maine Continues Progress

*Program of betterments improves service and brings economies — Net improves with lower gross*

THE Boston & Maine on June 6, with public officers and prominent shippers as guests, celebrated the opening of its new retarder-equipped Boston classification yards. Formal dedication of such a facility is perhaps somewhat unusual but, certainly in the case of the Boston & Maine, is entirely appropriate. Measures of modernization, of which the new Boston yard is but one step, have succeeded in bringing great increases in the efficiency of operation of the property. Moreover, it is fitting that the road's patrons should participate in such ceremonies, since every step in the improvement program has brought returns to them in better service; and New England needs excellent freight service to enable it to compete with other industrial regions.

The year 1924 may be taken as marking the beginning of the Boston & Maine's improvement. The road in that year had a net income after fixed charges of $1,772,737, as compared with a deficit of $3,491,070 in 1923. In 1925 net income reached $5,468,909; and in 1926, $6,573,404. In 1927 it fell off to $3,373,293—but this decline was due largely to abnormal flood conditions in November, and does not reflect any recession in the progress of the property. Without the flood and one or two other extraordinary expenditures, 1927 net would have neared that earned in 1926. Indeed, totals for the first four months of 1928 show net income of $1,870,031—almost half a million ahead of the same period of last year, and this with a decline of one million in gross.

This improvement has not come from any great increase in traffic. Revenue ton-miles in 1927 totaled 2,856 million, or the same as in 1924. Nor has the factor of rates been as important as might be supposed. In 1927 the average ton-mile revenue was 1.752 cents, as against 1.719 in 1924, in which year increased divisions for the New England carriers began to come into effect. This difference is less than 2 per cent and would account for less than one million dollars of the company's improvement in net from two million to six million (assuming, naturally, that but for the flood the company would have had at least the latter sum in net income in 1927).

It is to the operating statistics that one must turn for the reasons of the road's improved showing. In 1924 its coal consumption was 152 lb. per 1,000 gross ton-miles; in 1927 this had been reduced to 127 lb., an improvement of 16 per cent. Net ton-miles per car day rose to 321 in 1927, an increase of 16 per cent over 1924, and average daily car miles to 22.7, an increase of 19 per cent. These two figures incidentally give a measure of greater efficiency, not only selfishly considered but in terms of better service to shippers as well. Gross ton-miles per train-hour mounted to 14,159 in 1927, an improvement of 11 per cent over 1924 and net tons per train reached 1,331, an improvement of 12 per cent in the four-year period.

The Boston & Maine has important terminal problems. Its business originates or terminates, not at one or two important centers, but is spread out over a considerable area involving a network of branch lines. Junction points are numerous. To give the shipping and receiving public expeditious service under such conditions presents an operating problem of the first magnitude, particularly since traffic density on some of the branches is not heavy (revenue ton-miles per mile of road for the entire system were but 1,370,994 in 1927, which figure reflects the light-traffic branch mileage). Efficient operation of such a property requires expeditious and economical yard handling and heavy loading and acceleration of trains when made up for main line haul.

**Thoroughgoing Terminal Modernization Program**

The problem of terminal operation the Boston & Maine has tackled vigorously by the provision of modern yard facilities at Boston, White River Junction, Vt., and Mechanicville, N. Y., the latter two being important interchange points with connecting lines. All three yards are flood-lighted for efficient and safer operation at night and those at Boston and Mechanicville are hump yards equipped with power-operated switches and car retarders. Less extensive, though important, yard improvements have been made at several other points. In furtherance of its plan for accelerated and more economical yard operation the road has placed in service a number of the heaviest type of switching locomotives.

Late in 1927 a committee of officers of the railroad was appointed to make an exhaustive study of its freight service, co-ordinating terminal and line-haul movements more closely with local and switching movements—the goal being to utilize existing facilities to their utmost in saving money for the company and expediting the service to patrons.

One of the major handicaps under which the Boston & Maine labored for many years was the restricted clearances of the Hoosac tunnel, on its main line to western connections. In 1926 this condition was eliminated by lowering the road-bed and making other changes. In 1927 other restrictive clearances were corrected so that the road can now take any type of equipment offered. Costly detours have thus been avoided, as have delays to traffic liable to promote ill-feeling on the part of shippers.

The company's terminals in Boston have for many years been far short of the requirements of a large metropolis—both from the standpoint of efficient railroad operation and from that of the present-day demands of railroad patrons. The Boston & Maine, like many other carriers, is a consolidation of several lines. In the case of the Boston terminals, when the component lines were consolidated no attempt was made to unify the separate facilities. The result was wasteful operation and the retention of an unnecessary amount of valuable land with high tax assessments. Improvements are now under way to correct this condition. A new perishables terminal has been placed in service, as has a new freight house and warehouse with bulk delivery yard, crane facilities, etc., (the latter replacing two antiquated stations).

North Station, the Boston passenger terminal, is in course of reconstruction. The same ground area that formerly was given over to railroad facilities alone—which latter had grown less efficient and attractive with the years—will now house a modern passenger station, a sports coliseum, a hotel and a large office and industrial building. Boston & Maine real estate will thus earn greater returns and the new tenants, in addition to paying rent, will also probably be railroad patrons. In

connection with the new passenger station facilities the following quotation from the road's 1927 annual report is significant: "It is not proposed to construct an expensive and elaborate building, but one which will be adequate, comfortable and convenient as measured by present-day standards."

The Boston & Maine in common with most other railroads continues to suffer losses in passenger business. In 1927 its passenger earnings totaled $18,426,031, a decline of 8 per cent from the preceding year. The greatest decline was in local business, which is important, since a large proportion of its business comes in that category. The road in 1926 speeded up its through trains and made a strong bid for increased through business with the result that, not including leased lines, the Boston & Maine proper in that year experienced an increase in passenger revenues. In 1927 there was a recession, but the road holds the view that resistance to highway competition has been greater with its improved service than it would otherwise have been.

The road was a pioneer in motor coach operation, motor coaches being utilized as far back as 1924 to provide a less expensive service than trains where traffic was light. The service has grown steadily and in 1927, the highway subsidiary, the Boston & Maine Transportation Company, earned a gross of $861,783 from motor coach and truck operations, producing also for the first time a net income of $13,000. The gross earnings of this subsidiary were almost double those of 1926, which gives some indication of the rapidity with which its operations of this character are growing. The economies of this highway service, however, are not reflected in the figures of net earnings, so much as in the savings to the railroad by reason of providing more economical service.

In addition to motor coach service, the road is making a constantly increasing use of motor trucks in its freight service. Store-door collection and delivery of freight is provided at some points and the service is being extended.

Hand in hand with the introduction of highway service has proceeded further effort to reduce the losses from unremunerative branch lines. Public authorities have not looked with favor upon abandonment of all lines which do not pay their own way, although some progress in this direction has been possible. A method of dealing with this situation which has met with considerable success has been to turn certain short-line controlled roads over to local interests which, in several cases, have been able to keep the lines in operation with great reductions in losses, due to economies not possible for a Class I road paying standard wages and charging standard rates.

Maintenance of way expenses in 1927 showed an increase of almost $3,000,000 over the previous year due, as previously noted, to the November floods. In renewing washed-out bridges, however, the company was able to replace old structures with new, and elsewhere a consistent policy of bridge-strengthening to care for heavier locomotives is being carried out. Little ballasting had been done for a number of years, but in 1926 the road inaugurated a program in this direction and, under it 76 miles of line were ballasted with stone in 1927. A large pile and trestle area near the approach to North Station, Boston, has for years been a source of heavy maintenance expense and a program of filling has been undertaken which will require ten years for completion but which will each year reduce the outlay for maintenance. Traffic department expense has shown a steady increase each year, concurrent with the road's program of active solicitation and the establishment of additional off-line agencies, of which it now has 14; and the results they have accomplished have fully justified the expense.

In September, 1926, the capital structure of the road was reorganized. The principal features of this reorganization were the extension of maturities on $40,490,000 of bonds for 15 years and subscription to $13,000,000 of 7 per cent prior preference stock by the stockholders. The funds thus provided gave the road needed capital for a program of improvements which, it was estimated would pay an average of about 17 per cent on the investment.

In August, 1927, the company sold $30,942,000 of 40-year 5 per cent bonds on a 5.6 per cent basis, the proceeds of which were used to retire $29,298,500 of 6 per cent bonds held by the federal government and to reimburse the company's treasury for $1,644,000 of its 5 per cent bonds acquired from the public with the reorganization plan.

The net income of $3,373,293 after interest and other charges earned in 1927 was sufficient to pay the 7 per cent dividends on the prior preference stock and the varying rates on the first preferred, leaving a balance of $325,000. Had it not been for the flood the road would have shown substantial earnings on the remainder of its stock, including the common.

**Table II—Comparison of Selected Freight Operating Statistics of the Boston & Maine**

| | 1927 | 1924 | Per cent of change Inc. | Dec. |
|---|---|---|---|---|
| Mileage operated | 2,079 | 2,446 | | 15 |
| Gross ton-miles (thousands) | 7,631,166 | 7,348,445 | 3.8 | |
| Net ton-miles (thousands) | 3,014,060 | 3,011,324 | 0.01 | |
| Freight train-miles (thousands) | 5,733 | 6,149 | | 6.7 |
| Freight locomotive-miles (thousands) | 7,208 | 7,623 | | 5.4 |
| Freight car-miles (thousands) | 213,444 | 206,451 | 3.4 | |
| Freight train-hours | 517,382 | 578,339 | | 10.5 |
| Car-miles per day | 22.7 | 19.0 | 19.5 | |
| Net tons per loaded car | 20.3 | 20.6 | | 1.5 |
| Per cent loaded to total car-miles | 69.7 | 70.8 | | 1.5 |
| Net ton-miles per car day | 321 | 277 | 15.9 | |
| Freight cars per train | 38.3 | 34.6 | 10.7 | |
| Gross tons per train | 1,331 | 1,195 | 11.4 | |
| Net tons per train | 526 | 490 | 7.3 | |
| Train speed, miles per train-hour | 11.1 | 10.6 | 4.7 | |
| Gross ton-miles per train-hour | 14,159 | 12,706 | 11.4 | |
| Net ton-miles per train-hour | 5,826 | 5,207 | 11.9 | |
| Lb. coal per 1,000 gross ton-miles | 127 | 152 | | 16.4 |
| Loco.-miles per loco.-day | 56.8 | 45.0 | 26.2 | |
| Per cent freight locos. unserviceable | 20.3 | 28.4 | | 28.5 |
| Per cent freight cars unserviceable | 6.8 | 11.4 | | 40.3 |

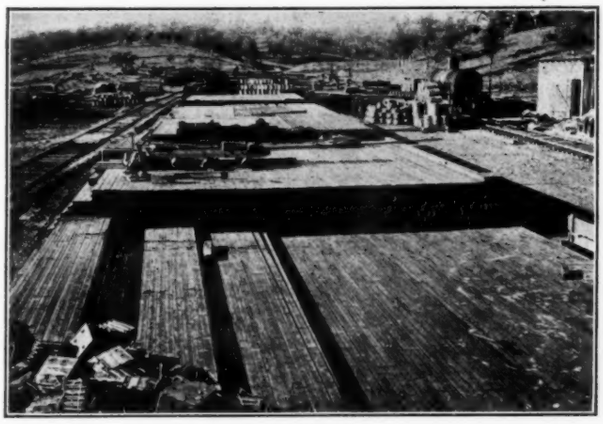
**Table I—Boston & Maine, Operating Results, Selected Items, 1920-1927**

| | 1920 | 1921 | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 |
|---|---|---|---|---|---|---|---|---|
| Mileage operated | 2,256 | 2,243 | 2,243 | 2,243 | 2,228 | 2,248 | 2,082 | 2,084 |
| Revenue ton-miles (thousands) | 3,705,528 | 2,673,769 | 2,689,915 | 3,103,817 | 2,744,214 | 2,959,491 | 3,037,192 | 2,856,590 |
| Revenue passenger miles (thousands) | 1,014,735 | 876,113 | 847,482 | 867,728 | 772,428 | 740,127 | 737,767 | 687,806 |
| Total operating revenue | $86,652,745 | $78,289,750 | $79,720,085 | $86,310,941 | $78,697,298 | $81,628,763 | $81,625,376 | $77,848,374 |
| Total operating expenses | 90,989,432 | 73,883,472 | 67,164,593 | 75,275,588 | 63,912,556 | 62,987,463 | 62,355,456 | 61,835,502 |
| Net operating revenue | —4,336,687 | 4,456,278 | 12,555,492 | 11,035,353 | 14,784,742 | 18,641,300 | 19,269,920 | 16,012,873 |
| Operating ratio | 105 | 94.3 | 84.3 | 87.1 | 81.2 | 77.16 | 76.39 | 79.43 |
| Net railway operating income | —$11,918,220 | —$1,401,768 | $6,296,285 | $3,079,241 | $8,972,022 | $12,407,815 | $12,841,103 | $9,500,773 |
| Total income | —5,813,828 | 3,436,271 | 7,093,297 | 3,732,774 | 9,438,514 | 13,395,127 | 14,717,153 | 11,240,841 |
| Deductions from income | 11,318,654 | 10,784,357 | 6,966,875 | 7,223,844 | 7,665,777 | 7,926,218 | 8,143,748 | 7,867,548 |
| Net after charges | *—17,132,482 | *—7,348,086 | * 126,422 | —3,491,070 | 1,772,737 | 5,468,909 | 6,573,404 | 3,373,293 |

* Corporate and federal combined excluding standard return and guaranty.
NOTE: Standard return for operations during federal control, $9,832,491.

# Railway Material Stocks Lower in 1927

*Railway Age summary shows $27,000,000 decrease on Class I roads over previous year*



THE railroads of the United States had over $27,000,000 less capital tied up in unapplied material (comprising fuel, rail and ties, as well as miscellaneous supplies) at the close of 1927 than at the close of 1926, according to the annual reports of Class I carriers. The figures of 114 Class I roads, including all the large carriers, shows the total value of material carried in stock by these roads at the close of 1927 to have been $518,583,494 as compared with $545,752,983 for the same roads at the close of 1926, a decrease of $27,169,489.

This decrease in the inventories for 1927 is a reversal of the trend of the previous year when an increase took place, but is a continuation of the general trend of the last five-year period. The 1927 stock balance represents a decrease of approximately five per cent from the previous year and was smaller than at any time since 1917, notwithstanding that operating expenses and railway business in general have increased in that period. The stock carried by the Class I roads at the close of each year since 1916 and the increases or decreases are given in Table I.

Table II gives the roads included in the summary for 1927. In developing this table recognition has been given the fact that in many instances the supplies carried in stock by one corporate property are, in part or whole, available to other corporate properties, and that the supplies reported separately by several companies are sometimes acquired and handled by the same organization, etc. To compensate for such conditions, and in order that the figures reported may facilitate comparisons, the plan has been followed, as far as practicable, of consolidating the inventories in such cases. The principal consolidations are:

Atchison, Topeka & Santa Fe, Gulf Colorado & Santa Fe and Panhandle & Santa Fe.

Atlanta & West Point, Georgia Railroad and Western Railway of Alabama.

Atlantic Coast Line and Charlestown & South Carolina.

Chicago, Rock Island & Pacific and Chicago, Rock Island & Gulf.

Cleveland, Cincinnati, Chicago & St. Louis, Cincinnati Northern and the Evansville, Indianapolis & Terre Haute.

Erie, Chicago & Erie, New Jersey & New York and New York, Susquehanna & Western.

Illinois Central, Gulf, & Ship Island and Yazoo & Mississippi Valley.

Kansas City, Mexico & Orient and Kansas City, Mexico & Orient & Texas.

Louisiana Railway & Navigation Company and Louisiana Railway & Navigation Company of Texas.

Minneapolis, St. Paul & Sault Ste. Marie and Duluth, South Shore & Atlantic.

Missouri-Kansas-Texas and Missouri-Kansas-Texas of Texas.

New York, New Haven & Hartford and Central New England.

Reading, the Atlantic City and the Port Reading.

St. Louis Southwestern and St. Louis Southwestern of Texas.

Southern, Alabama Great Southern, Cincinnati, New Orleans & Texas Pacific, Georgia Southern & Florida, New Orleans & Northeastern and the Northern Alabama.

Southern Pacific, Texas & Louisiana Lines, including the Galveston, Harrisburg & San Antonio, the Houston & Texas Central, the Houston East & West Texas, Morgan's Louisiana & Texas Lines and the Texas & New Orleans.

Pennsylvania, Baltimore, Chesapeake & Atlantic and the West Jersey & Sea Shore.

Missouri Pacific, the International-Great Northern and the Gulf Coast Lines, the latter including the New Orleans, Texas & Mexico, the St. Louis, Brownsville & Mexico, the San Antonio, Uvalde & Gulf and the Beaumont, Sour Lake & Western.

Union Pacific, Los Angeles & Salt Lake, Oregon Short Line, Oregon-Washington Railway & Navigation Company and St. Joseph & Grand Island.

### Reductions on 71 Roads

For comparative purposes the value of material and supplies on hand at the close of 1927 is given for each system and also the value of material and supplies on hand at the close of the preceding year, determined on the same basis. Out of 114 carriers there were reductions in stock on 71 and increases on 43.

The largest reduction took place on the Pennsylvania, where the material balance at the close of 1927 was $8,376,223 less than at the close of 1926. Next to the Pennsylvania is the Southern Pacific, Pacific System, with a reduction of $4,665,635, while the New York Central is third with a reduction of $3,129,848. Other large reductions include that of the Missouri Pacific amounting to $2,232,789; the Seaboard Air Line, $1,975,732; the Chicago, Burlington & Quincy, $1,536,195; the Chicago, Rock Island & Pacific, $1,502,466; the Erie, $1,489,505; the Chesapeake & Ohio, $1,203,129; and the New York, Chicago & St. Louis, $1,086,570.

There were increases in excess of $500,000 on only three roads, the Atchison, Topeka & Santa Fe leading the list with an increase of $2,707,719, followed by the

Pere Marquette with an increase of $690,900 and the Western Pacific with an increase of $666,572.

### Chesapeake & Ohio Has Lowest Index

There has been much criticism of the ratio which the material and supplies carried in stock by a railroad bears to the annual operating expenses as a measure of the stock carried. It is commonly objected that this ratio is likely to be unfair as a just measure of a road's efficiency in handling and controlling its supplies. On account of the prevalence in the practice of using this ratio, however, it is employed in this tabulation. In each instance the annual operating expenses of the various properties have been grouped and consolidated in the same way as in determining the inventories. The analysis shows ratios ranging from 5.6 per cent of annual operating expenses to approximately 25 per cent, the Chesapeake & Ohio leading the entire field with a balance at the close of 1927, representing only 5.6 per cent of its annual operating expenses.

Out of the 114 roads reported there are 62 cases in which the ratio for 1927 is less than that for 1926, and the number of cases in which the ratio was below ten per cent is large, including the Bessemer & Lake Erie, with a ratio of 8.3 per cent, the Central of Georgia, 9.8 per cent, the Central of New Jersey, 9.9 per cent, the Chesapeake & Ohio, 5.6 per cent, the Chicago & Alton, 5.8 per cent, the Chicago & Eastern Illinois, 6.2 per cent, the Chicago Great Western, 8.2 per cent, the Monon, 8.8 per cent, the Chicago, Rock Island & Pacific, 8.5 per cent, the Detroit, Toledo & Ironton, 6.2 per cent, the Elgin, Joliet & Eastern, 7.3 per cent, the Erie, 8.3 per cent, the Hocking Valley, 6.8 per cent, the New York, Chicago & St. Louis, 8.5 per cent, the Pennsylvania, 9.1 per cent, the St. Louis-San Francisco, 8.0 per cent, the Los Angeles & Salt Lake, 9.3 per cent, the Wabash, 9.4 per cent, and the Wheeling & Lake Erie, 9.4 per cent.

**Table I—Supplies on Class I Railways—1916 to 1927**

| Year | Stocks on Hand End of Year | Increase from Previous Year |
|---|---|---|
| 1916 | $323,556,387 | ..... |
| 1917 | 502,986,042 | $179,429,655 |
| 1918 | 630,207,210* | 127,221,168 |
| 1919 | 597,573,735* | — 35,633,475 |
| 1920 | 755,563,278 | 157,989,543 |
| 1921 | 665,147,099 | — 99,415,179 |
| 1922 | 546,284,853 | —118,862,246 |
| 1923 | 682,725,812 | 136,440,959 |
| 1924 | 560,048,899 | —122,676,913 |
| 1925 | 525,853,107 | — 34,195,792 |
| 1926 | 551,694,794 | 25,841,689 |
| 1926 | 545,752,983** | ..... |
| 1927 | 518,583,494** | — 27,169,489** |

* Estimated for Class I railways on years of government operation, on the basis of stocks held by all railways.
** Total for roads shown in Table II.

**Table II—Material and Supplies Carried 1926 and 1927**

| | On Hand Dec. 31, 1927 | On Hand Dec. 31, 1926 | Increase | Per Cent of Operating Expenses 1927 | 1926 |
|---|---|---|---|---|---|
| Akron, Canton & Youngstown | $ 163,308 | $ 206,522 | $ —43,214 | 7.8 | 9.2 |
| Ann Arbor | 500,445 | 542,822 | —42,377 | 11.5 | 12.1 |
| Atchison, Topeka & Santa Fe Lines | 29,774,215 | 27,066,496 | 2,707,719 | 16.6 | 16.1 |
| Atlanta & West Point Lines | 1,442,856 | 1,005,082 | 437,774 | 15.3 | 15.5 |
| Atlanta, Birmingham & Coast | 785,075 | 818,584 | —33,509 | 15.8 | 15.7 |
| Atlantic Coast Lines | 8,453,850 | 9,012,266 | —558,416 | 12.7 | 12.2 |
| Baltimore & Ohio | 20,468,469 | 19,694,181 | 774,288 | 10.3 | 10.9 |
| Bangor & Aroostook | 824,583 | 762,204 | 62,379 | 16.6 | 15.8 |
| Bessemer & Lake Erie | 797,966 | 842,075 | —44,109 | 8.3 | 8.5 |
| Boston & Maine | 6,849,778 | 6,972,468 | —122,690 | 11.1 | 11.2 |
| Buffalo & Susquehanna | 159,843 | 170,430 | —10,587 | 10.3 | 12.4 |
| Buffalo, Rochester & Pittsburgh | 2,024,423 | 1,678,916 | 345,507 | 13.1 | 11.2 |
| Central of Georgia | 2,040,654 | 2,066,099 | —25,445 | 9.8 | 9.1 |
| Central of New Jersey | 4,307,010 | 3,991,266 | 315,744 | 9.9 | 8.7 |
| Chesapeake & Ohio | 4,964,772 | 6,167,901 | —1,203,129 | 5.6 | 6.3 |
| Chicago & Alton | 1,294,092 | 1,331,831 | —37,739 | 5.8 | 5.3 |
| Chicago & Eastern Illinois | 1,342,922 | 1,640,122 | —297,200 | 6.2 | 7.2 |
| Chicago & Illinois Midland | 288,053 | 104,685 | 183,368 | 12.5 | 10.8 |
| Chicago & North Western | 12,564,849 | 13,509,202 | —944,353 | 10.8 | 11.7 |
| Chicago, Burlington & Quincy | 12,487,544 | 14,023,739 | —1,536,195 | 11.2 | 12.1 |
| Chicago Great Western | 1,613,103 | 1,482,071 | 131,032 | 8.2 | 7.3 |
| Chicago, Indianapolis & Louisville | 1,198,694 | 1,454,975 | —256,281 | 8.8 | 10.9 |
| Chicago, Milwaukee, St. Paul & Pacific | 13,507,305 | 14,057,800 | —550,495 | 10.1 | 10.9 |
| Chicago, Rock Island & Pacific Lines | 8,866,374 | 10,368,840 | —1,502,466 | 8.5 | 10.1 |
| Chicago, St. Paul, Minneapolis & Omaha | 2,644,948 | 2,392,443 | 252,505 | 12.2 | 11.2 |
| Cleveland, Cincinnati, Chicago & St. Louis | 7,823,870 | 7,503,337 | 320,533 | 10.4 | 10.0 |
| Clinchfield | 903,697 | 838,183 | 65,514 | 17.8 | 16.1 |
| Colorado & Southern | 960,672 | 1,137,399 | —176,727 | 9.0 | 11.1 |
| Columbus & Greenville | 188,309 | 187,923 | 386 | 12.1 | 12.3 |
| Delaware & Hudson | 3,452,445 | 3,513,864 | —61,419 | 10.0 | 10.1 |
| Denver & Rio Grande Western | 2,900,118 | 3,004,745 | —104,627 | 11.5 | 12.3 |
| Denver & Salt Lake | 449,546 | 495,478 | —45,932 | 13.3 | 13.3 |
| Detroit & Mackinac | 288,870 | 356,206 | —67,336 | 23.0 | 24.8 |
| Detroit & Toledo Shore Line | 245,952 | 251,140 | —5,188 | 10.3 | 10.7 |
| Detroit, Toledo & Ironton | 429,763 | 753,560 | —323,797 | 6.2 | 8.6 |
| Duluth & Iron Range | 701,311 | 715,808 | —14,497 | 15.0 | 15.0 |
| Duluth, Missabe & Northern | 1,341,826 | 1,399,794 | —57,968 | 17.2 | 16.7 |
| Elkin, Joliet & Eastern | 1,240,459 | 1,305,480 | —65,021 | 7.3 | 7.5 |
| Erie System | 8,718,516 | 10,208,021 | —1,489,505 | 8.3 | 9.7 |
| Florida East Coast | 3,643,075 | 4,138,715 | —495,640 | 25.4 | 19.9 |
| Fort Smith & Western | 228,804 | 192,962 | 35,842 | 16.1 | 13.4 |
| Fort Worth & Denver City | 1,031,579 | 1,075,960 | —44,381 | 12.2 | 13.6 |
| Georgia & Florida | 128,690 | 244,207 | —115,517 | 8.5 | 8.6 |
| Great Northern | 10,404,003 | 9,834,357 | 569,646 | 13.3 | 12.4 |
| Green Bay & Western | 309,855 | 315,684 | —5,829 | 25.2 | 24.8 |
| Gulf, Mobile & Northern | 746,096 | 479,312 | 266,784 | 14.0 | 11.0 |
| Hocking Valley | 916,946 | 886,567 | 30,379 | 6.8 | 6.4 |
| Illinois Central System | 14,211,911 | 14,418,502 | —206,591 | 9.7 | 9.9 |
| Kansas City, Mexico & Orient Lines | 611,561 | 679,842 | —68,281 | 6.9 | 11.3 |
| Kansas City Southern Lines | 2,272,132 | 1,990,731 | 281,401 | 15.4 | 12.9 |
| Lake Superior & Ishpeming | 238,494 | 276,852 | —38,358 | 17.5 | 19.2 |
| Lehigh & Hudson River | 195,986 | 245,533 | —49,547 | 8.5 | 10.4 |
| Lehigh & New England | 428,665 | 368,148 | 60,517 | 10.6 | 10.2 |
| Lehigh Valley | 6,523,267 | 6,145,541 | 377,726 | 11.0 | 10.1 |
| Long Island | 2,197,095 | 2,020,856 | 176,239 | 7.3 | 6.9 |

## Table II—Material and Supplies Carried 1926 and 1927 (continued)

| | On Hand Dec. 31, 1927 | On Hand Dec. 31, 1926 | Increase | Per Cent of Operating Expenses 1927 | 1926 |
|---|---|---|---|---|---|
| Louisiana & Arkansas | 447,263 | 408,213 | 39,050 | 16.5 | 14.4 |
| Louisiana Ry. & Navigation Lines | 539,155 | 672,791 | —73,636 | 14.4 | 14.3 |
| Louisville & Nashville | 15,220,877 | 15,255,029 | —34,152 | 13.5 | 13.5 |
| Louisville, Henderson & St. Louis | 272,492 | 298,913 | —26,421 | 9.1 | 10.4 |
| Maine Central | 1,769,130 | 1,845,365 | —76,235 | 11.0 | 11.6 |
| Michigan Central | 6,169,092 | 6,161,943 | 7,149 | 9.9 | 9.5 |
| Midland Valley | 357,604 | 412,980 | —55,376 | 14.2 | 16.1 |
| Minneapolis & St. Louis | 1,376,781 | 1,522,942 | —146,161 | 10.7 | 11.4 |
| Minneapolis, St. Paul & Sault Ste. Marie Lines | 4,369,132 | 4,776,492 | —407,360 | 11.2 | 11.9 |
| Mississippi Central | 109,946 | 122,530 | —12,584 | 9.1 | 10.1 |
| Missouri & North Arkansas | 176,223 | 183,387 | —7,164 | 11.3 | 10.5 |
| Missouri-Kansas-Texas Lines | 6,350,302 | 6,777,785 | —427,483 | 16.1 | 17.0 |
| Missouri Pacific Lines | 18,478,625 | 20,710,623 | —2,231,998 | 14.4 | 16.4 |
| Gulf Coast Lines | 2,949,481 | 2,867,391 | 82,090 | 21.8 | 28.6 |
| International Great Northern | 3,293,305 | 3,374,604 | —81,299 | 22.0 | 22.2 |
| Missouri Pacific | 12,235,839 | 14,468,628 | —2,232,789 | 12.3 | 14.1 |
| Mobile & Ohio | 1,330,718 | 1,450,745 | —120,027 | 9.8 | 10.2 |
| Monongahela | 381,088 | 381,890 | —802 | 9.7 | 10.7 |
| Montour | 112,871 | 142,981 | —30,110 | 9.2 | 12.1 |
| Nashville, Chattanooga & St. Louis | 2,439,155 | 2,641,162 | —202,007 | 13.3 | 13.9 |
| Nevada Northern | 138,574 | 145,820 | —7,246 | 29.3 | 30.4 |
| New Orleans Great Northern | 208,158 | 187,372 | 20,786 | 8.9 | 8.2 |
| New York Central | 32,388,782 | 35,518,630 | —3,129,848 | 11.0 | 11.9 |
| New York, Chicago & St. Louis | 3,266,289 | 4,352,859 | —1,086,570 | 8.5 | 10.9 |
| New York, New Haven & Hartford | 14,074,291 | 14,868,268 | —793,977 | 13.7 | 14.1 |
| New York, Ontario & Western | 1,657,654 | 1,580,821 | 76,833 | 15.2 | 14.4 |
| Norfolk & Western | 13,862,626 | 13,707,207 | 155,419 | 19.8 | 19.3 |
| Norfolk Southern | 718,421 | 514,448 | 203,973 | 10.5 | 7.2 |
| Northern Pacific | 11,653,089 | 11,364,792 | 288,297 | 17.2 | 16.7 |
| Northwestern Pacific | 647,151 | 754,965 | —107,814 | 12.1 | 14.7 |
| Pennsylvania System | 47,449,084 | 55,825,307 | —8,376,223 | 9.1 | 9.9 |
| Pere Marquette | 3,227,021 | 2,536,121 | 690,900 | 10.2 | 8.0 |
| Pittsburgh & Lake Erie | 3,299,515 | 3,122,958 | 176,557 | 12.5 | 11.3 |
| Pittsburgh & Shawmut | 141,694 | 132,877 | 8,817 | 9.5 | 10.2 |
| Pittsburgh & West Virginia | 180,809 | 176,327 | 4,482 | 7.5 | 6.1 |
| Pittsburgh, Shawmut & Northern | 244,160 | 231,003 | 13,157 | 15.9 | 14.2 |
| Reading System | 8,235,686 | 8,043,074 | 192,612 | 10.6 | 10.2 |
| Richmond, Fredericksburg & Potomac | 1,304,134 | 1,576,899 | —272,765 | 15.5 | 18.4 |
| Rutland | 942,575 | 877,386 | 65,189 | 16.9 | 15.8 |
| St. Louis-San Francisco Lines | 4,911,023 | 5,035,545 | —124,522 | 8.0 | 7.7 |
| St. Louis Southwestern Lines | 4,413,502 | 4,223,767 | 189,735 | 23.8 | 21.8 |
| Seaboard Air Line | 5,558,179 | 7,533,911 | —1,975,732 | 11.9 | 15.2 |
| Southern System | 15,426,359 | 16,402,869 | —976,510 | 11.4 | 11.6 |
| Southern Pacific, Pacific Lines | 27,599,510 | 32,265,145 | —4,665,635 | 17.2 | 22.1 |
| Southern Pacific, Texas & La. Lines | 8,277,498 | 9,501,462 | —1,223,964 | 14.2 | 17.5 |
| Spokane, Portland & Seattle | 767,863 | 680,000 | 87,863 | 14.3 | 12.9 |
| Tennessee Central | 359,215 | 293,760 | 65,455 | 13.3 | 11.3 |
| Texas & Pacific | 4,102,506 | 4,030,978 | 71,528 | 14.3 | 15.2 |
| Trinity & Brazos Valley | 390,090 | 363,113 | 26,977 | 15.8 | 14.0 |
| Ulster & Delaware | 171,083 | 180,498 | —9,415 | 17.0 | 16.7 |
| Union Pacific System | 16,413,798 | 16,469,134 | —55,336 | 11.5 | 11.4 |
| Los Angeles & Salt Lake | 1,905,890 | 1,987,945 | —82,055 | 9.3 | 9.6 |
| Oregon Short Line | 3,500,917 | 3,640,931 | —140,014 | 14.3 | 13.9 |
| Oregon-Washington Ry. & Nav. | 2,643,038 | 2,566,917 | 76,121 | 10.8 | 11.6 |
| St. Joseph & Grand Island | 411,554 | 350,801 | 60,753 | 17.8 | 13.0 |
| Union Pacific | 7,952,399 | 7,922,540 | 29,859 | 10.7 | 11.3 |
| Virginian System | 2,288,537 | 2,571,631 | —283,094 | 19.6 | 19.5 |
| Wabash | 4,805,118 | 5,391,958 | —586,840 | 9.4 | 10.1 |
| Western Maryland | 2,477,676 | 2,235,324 | 242,352 | 16.5 | 12.8 |
| Western Pacific | 2,609,091 | 1,942,519 | 666,572 | 19.8 | 17.4 |
| Wheeling & Lake Erie | 1,280,923 | 954,093 | 326,830 | 9.4 | 16.4 |
| Wichita Valley | 92,712 | 106,644 | —13,932 | 9.0 | 12.1 |

* * * *

**The British Royal Train at Crewe on the L. M. S.**

# Hearing on Trucking in New York

*Delay granted carriers for decision on rebuttal — Store-door collection and delivery proposed by Merchants' Association*

WITH the completion, on June 11, of testimony presented by the several participants to the Interstate Commerce Commission investigation into freight trucking in New York, the hearing was adjourned until July 5, in order that the respondent carriers may decide in the meantime whether or not they care to offer any evidence in rebuttal. Foregoing testimony in this case which opened on May 22 and which is being heard before Attorney-Examiner Harry C. Ames and Commissioner Claude R. Porter has been reported in preceding issues of the *Railway Age*.

The continuance until July 5 was granted upon the request of General Solicitor E. H. Burgess of the Lehigh Valley, speaking on behalf of counsel for all the roads. Mr. Burgess stated that the carriers wanted time to study the proposals which have been entered. Examiner Ames announced that if, after such study, time for rebuttal is not requested by the carriers, the hearing will not reconvene. He fixed August 15 as the date upon which briefs should be filed and read a short statement, outlining the scope and issues of the case, to aid counsel in the preparation of these briefs.

### Substitutes Urged for Constructive Stations

Two different plans for delivery of freight in New York were proposed as substitutes for the present trucking operations of the railway contract truckmen by witnesses appearing during the closing sessions. One is the plan involving store-door collection and delivery of carload freight while the other contemplates a railway allowance to consignees who will accept delivery at the rail head instead of the piers, thus permitting such patrons to designate any truckman to make the haul. The former is the plan submitted by Traffic Manager W. H. Chandler of the Merchants' Association of New York while the latter is sponsored by the Merchant Truckmen's Bureau of New York.

### Central Vermont Attitude Undetermined

In addition to the evidence of the foregoing organizations, closing testimony was also given by representatives of the Newspaper Publishers Association, the Motor Haulage Company, the United States Trucking Corporation, the New York Dock Railway, and the Brooklyn Eastern District Terminal. Also the position of the Central Vermont, which provides constructive delivery in New York from the piers where its boats tie up, was defined in a communication from that company. This communication held that the Central Vermont had reached no conclusion as to the merits of the trucking practices and thus had no testimony to offer. The attitude of the Queensborough Chamber of Commerce was stated to be one opposed to any action which would place railway patrons in that district at a competitive disadvantage with business men in other parts of the metropolitan area.

When the hearing reconvened on June 7, Examiner Ames opened with a request that the proceeding be expedited as much as possible by the elimination of duplicating questions in cross-examination. He stated that the appropriations of the Interstate Commerce Commission had been depleted to a point where it was found necessary to abandon some scheduled June hearings and it was only after persuasion that the present case was permitted to continue.

Shortly after the opening, cross-examination of Billings Wilson, deputy manager of the Port of New York, Authority, was concluded. In response to John F. Finerty, representing Brooklyn Eastern District Terminal, this witness agreed that there is little need for constructive station service in Brooklyn where there are now adequate team track facilities. Mr. Wilson prefaced his answer with the statement that he regarded the constructive station as a substitute for team track facilities.

Asked by General Solicitor Burgess of the Lehigh Valley if the Port Authority plan contemplated any railway occupancy of the piers, the witness stated that it did not, save for perishable traffic, and added that the plan contemplated no abandonment of present team track facilities. When Mr. Burgess asked about the proposed contract under which the successful bidder for the operation of the proposed Port Authority universal station would function, Wilbur LaRoe, Jr., of counsel for the Port Authority announced that this contract could not be filed as promised but would be made available to participating counsel for use of such portions as may be desired.

### Railway Group Preferred as Universal Station Operator

A representative of terminal interests brought out that the Port Authority still has a waterfront terminal under contemplation but has postponed its consideration until the inland stations, which it regards as more necessary, are established. It was next developed that the Port Authority would like to see a group of railroads, in a terminal association, operate the proposed universal facility. In reply to General Solicitor A. H. Elder of the Central of New Jersey, Mr. Wilson stated that the constructive station arrangement is an essential part of the Port Authority plan for Manhattan.

The questioning was then taken up by Examiner Ames whom Mr. Wilson told that the Port Authority is prepared to provide carriers with tenants for the piers at remunerative rentals. Mr. Wilson further testified in response to the Examiner that it is not expected that warehouse interests will care to pay the rent to be exacted for the upper floors of the proposed universal station.

This concluded the testimony of Mr. Wilson and Mr. LaRoe proceeded to call a few railway patrons, each of whom testified to a preference for the constructive station over pier station delivery. Several also expressed a desire to see a universal station established on Manhattan. These witnesses were cross-examined briefly by several of the participating counsel and by Examiner Ames. With the close of such cross-examination, Mr. LaRoe announced that the Port Authority had concluded the presentation of its direct evidence.

### Merchants' Association Opens Case

Following the close of the Port Authority case, Traffic Manager W. H. Chandler of the Merchants' As-

sociation opened the presentation of that organization's direct evidence through a number of witnesses selected from among railway patrons who are employing the trucking services. The representative of a paper company stated to Examiner Ames that a lower trucking rate for the haul beyond the constructive station or lighterage point influences the routing of traffic over the road whose contract truckman makes that lower rate. Another of these witnesses testified that he received a rate of 1.6 cents per 100 lb. for a haul from his shipping platform to a lighterage point, 500 feet away, where the truckman became the agent of the railroad under a trucking in lieu of lighterage arrangement. This same witness admitted to Mr. LaRoe of Port Authority counsel that he had been approached by a truckman who offered to perform, for nothing, the shipper's part of the trucking service. The witness added, however, that the truckman making such a proposition had no railroad contract but represented that a contract would be forthcoming if this shipper's business could be obtained.

### Trucking in Lieu of Lighterage Available on Demand

In cross-examining one of this succession of witnesses, Examiner Ames brought out the expression that the optional feature of the trucking in lieu of lighterage tariff, i. e. the provision that the service is performed at the option of the carrier, means little in practice since patrons were said to be able to obtain this service on demand.

Remaining cross-examination of these railway patrons was confined largely to questions relating to the rates paid for the trucking service beyond the point up to which the carrier is supposed to place the shipment, whether that be a constructive station or free lighterage point. Many, however, testified that they would prefer trucking services even if their cartage rates should rise to equal the charges formerly paid for the haul from the pier stations.

### Store-Door Service Sponsored

Shortly after the opening of the morning session of June 8, Traffic Manager Chandler of the Merchants' Association, himself, took the witness stand to read a lengthy statement which outlined the attitude of his organization in the present proceeding and continued to propose a scheme for store-door collection and delivery of carload freight on Manhattan Island.

Prefacing the exposition of his plan with a statement that the indefiniteness of previous proposals for store-door service has prevented shippers from defining their attitudes on the matter, the witness continued to say that there is no justification for asking store-door delivery unless it can be shown as being advantageous to the carriers as well as their patrons. Mr. Chandler next emphasized that provision of the proposed plan which would limit the collection and delivery service to carload freight, arguing that considerable experience should be gained before such service is extended to l. c. l. freight, if, indeed, such extension is ever considered.

Details of the plan, according to Mr. Chandler, should be worked out by a committee representing the railways, railway patrons and truckmen. The witness further stated that some zoning for trucking rates may be necessary while he held that these rates could be readily agreed upon by the parties concerned.

If this recommendation of store-door collection and delivery be rejected, Mr. Chandler declared the attitude of his organization would then be one favoring a continuance of the present trucking practices. He added that the New York Central appears to have been unconcerned in the rates paid by patrons for the truck movement beyond the lighterage free delivery point in the trucking in lieu of lighterage service offered by that road. The witness believed that this should be the attitude of all the carriers in constructive station services unless they assume responsibility for the entire collection and delivery movement.

### Merchants Oppose Loading Charge

In concluding his direct testimony, Mr. Chandler said that the Merchants' Association was in substantial agreement with the Port Authority, the only exception being the refusal of his organization to endorse the loading charge of two cents per 100 lbs. which Deputy Manager Wilson of the Port Authority would impose upon railway patrons accepting the constructive station services.

Following the close of Mr. Chandler's statement, Examiner Ames ruled that cross examination should be confined to the facts presented and excluded any discussion of the argumentative features.

Responding to opening cross-examiners Mr. Chandler stated that he would make the collection and delivery service optional with the shippers. Further, he saw no reason why the service should be extended to Brooklyn, since he does not think it is necessary where there are adequate facilities for team track delivery. He later agreed that a rate for Brooklyn service should be provided but did not think shippers in that district would find the service economical.

In response to General Solicitor Burgess of the Lehigh Valley, the witness thought that present piers and inland stations would be necessary for the handling on l. c. l. freight even though the plan were adopted but added that piers might be released by increased use of inland stations.

Mr. Finerty, counsel for Brooklyn Eastern District Terminal, brought out the fact that the Merchants' Association plan contemplates a published charge to be added to the flat New York rate on shipments billed for the collection and delivery service.

In concluding the cross-examination of Mr. Chandler, Examiner Ames compared the position of the New Jersey railway patrons with those on Manhattan, should these latter enjoy a store-door service. The witness could see no possibility of undue discrimination for he held that there is no justification for collection and delivery service where adequate team tracks are available for the patrons to make their own collections and deliveries.

### Pennsylvania Witness Recalled

At the opening of the afternoon session J. W. Roberts, general superintendent of transportation, Eastern region of the Pennsylvania, returned to the witness stand to introduce cost figures on floating operations. These were requested by counsel for the Port Authority and after brief cross-examination by this counsel, Mr. Roberts was excused. Mr. Roberts also furnished copies of a report which he made in 1925 on the collection and delivery services of British railways. This was introduced as an exhibit by Mr. LaRoe of Port Authority counsel.

### Consignee Allowance Plan of Truckmen

Following Mr. Roberts, the evidence of the Mer-

chant Truckmen's Bureau of New York was offered through the testimony of H. A. Stetler, a member of the committee appointed by the bureau to handle the case. This witness outlined a plan for the continuance of the trucking operations on what the bureau considered to be a basis equitable to all truckmen. This plan would extend to all railway patrons the right to truck freight from the rail heads with their own truckmen. It provided for an allowance from the carrier to patrons accepting such delivery. After brief cross-examination on the details of the plan, this witness was excused.

### Abrupt Adjournment Threatened

Here came a lapse with none of the remaining participants prepared to continue with the presentation of the evidence. Whereupon Examiner Ames warned counsel to cease waiting for the other fellow and agree upon a sequence for the remaining presentations, lest he be forced to adjourn the hearing in an abrupt manner. Commissioner Porter further stated that unless agreement to procedure were reached among counsel the hearing would be adjourned entirely or else reconvened in Washington.

### Newspapers Seek Trucking Allowance

P. McCollester, counsel for the Newspaper Publishers Association, stepped into the breach to open his case with the testimony of W. J. Mathey, traffic manager of the American Newspaper Publishers Association. Mr. McCollester first outlined the attitude of his clients, who are convinced that any economy in freight handling should be encouraged and that a diversion of some traffic from the piers is necessary. The newspapers, according to Mr. McCollester, are perhaps the largest users of the constructive stations and, while they are not saying it is ideal, they regard the plan as a step in the right direction. Mr. Mathey, who stated that some papers own trucks, advocated a railway allowance to these truck-owners who do their own hauling from the rail heads. This allowance would be similiar to the present allowances to contract truckmen in constructive station service. The witness would not advocate a general allowance applicable to all freight but held newsprint paper to be a special class of non-competitive traffic, admirably adapted to a direct movement from rail heads. Mr. Mathey testified that the newspapers accept no deliveries under the trucking in lieu of lighterage tariffs.

Mr. McCollester closed his case on June 9 with the testimony of George F. Hufnager, purchasing agent of the New York Herald-Tribune, and James J. Brown, traffic manager of the New York Daily News. The former explained the receipt of newsprint paper through the constructive stations while the latter outlined its receipt from the piers in newspaper-owned trucks. Mr. Brown advocated the allowance, sponsored by Mr. Mathey, since it would enable his company to send its trucks to the rail heads rather than to the piers for the paper.

P. W. Moore, manager of the traffic bureau, Queensborough Chamber of Commerce, testified briefly to advocate that no action be taken in the case which would place Queens shippers at a disadvantage with those of Manhattan. He commended the trucking in lieu of lighterage service of the New York Central, holding that this carrier had placed all sections of New York City on the same rate basis. After cross-examination by Mr. Finerty, Brooklyn Eastern District Terminal counsel, this witness was excused.

### Testimony of Motor Haulage Company

J. A. Hoffman, vice-president of the Motor Haulage Company, was next called to explain the trucking which his company does under railway contracts. This concern performs trucking in lieu of lighterage and constructive station services for several of the carriers. It charges from 5 to 12 cents per 100 lb. to the consignee for the movement beyond the constructive station lines and from 1 to 8 cents for the movement beyond the lighterage point on constructive delivery of New York Central freight trucked in lieu of being lightered. Cost figures for different truck movements were placed into the record by the witness. These indicated that in all cases, except in that of the 8½ cents per 100 lb. paid by the New York Central for trucking in lieu of lighterage on Manhattan, the trucking concern did not receive, in the railway allowance, its estimated cost of the service performed while acting as the carrier's agent up to the constructive station lines. Thus, Mr. Hoffman said, a payment by the patron is necessary to insure a profit from the operations. Mr. Hoffman was cross-examined on these figures at some length by participating counsel while Examiner Ames asked a few concluding questions.

### Terminals Losing Business to Trucks

Testimony of the New York Dock Railway was introduced at the opening of the morning session of June 11 when D. L. Tilley, president, took the witness stand. This witness stated that the trucking in lieu of lighterage practice has taken much business from his company and declared that this substitution of trucking service is made for competitive reasons irrespective of the cost.

On being asked why former New York Dock patrons had turned to the trucking services, Mr. Tilley stated that he had been told by some of these patrons that the substitute trucking services gives them a lower haulage rate, sometimes as low as one or two cents per 100 lb. and also eliminates demurrage charges. In response to another question the witness held that discrimination would be present if the high density commodities were diverted to the trucks while the lighter freight was left to the contract terminals. It was also said that the New York Dock takes no position with regard to the Manhattan constructive and inland stations.

### U. S. Trucking Railway Service Investment Is $1,500,000

George W. Daniels, assistant to the president and executive operating vice president of the United States Trucking Corporation, followed Mr. Tilley. Mr. Daniels said that the United States Trucking Corporation is neutral on the questions involved in the investigation and proceeded to describe the trucking which his company performs under railway contracts. The witness testified that this corporation has an investment of $1,500,000 in equipment assigned to railway freight service. Working capital of approximately $250,000 is required to carry on the work, Mr. Daniels added. The U. S. Trucking Corporation has, assigned to railway service, 22 tractors, 106 trailers and more than 100 motor and horse drawn trucks.

The witness was first cross-examined on the inland stations which his company operates and above which are storage facilities of the Independent Warehouses, Inc., a U. S. Trucking Corporation subsidiary. He stated that less than 15 per cent of the freight handled at the inland stations is stored in the warehouses of

the Independent Warehouses, Inc. He added that but 20 per cent of the freight hauled away from or to the inland stations for railway patrons is drayed by his company. This latter agrees with previous testimony of General Superintendent Roberts of the Pennsylvania on the point.

### U. S. Admits By-Passing Inland Stations

The witness admitted that on a few occasions constructive delivery has been given on freight billed to the inland station and referred to the case of this nature which Mr. Roberts of the Pennsylvania stated was under investigation at the time of the latter's original testimony.

Objection was made to an inquiry by counsel for the Port Authority's concerning trucking costs but the matter was settled when counsel for the U. S. Trucking Corporation agreed to permit the introduction of results of a trucking cost study now being made by the Pennsylvania. Pennsylvania representatives agreed to make these results available as soon as possible.

In response to another questioner, Mr. Daniels stated that his company does not make a charge to any consignee which is under the specified minimum for constructive station delivery. He stated that trucking in lieu of lighterage, under the New York Central contract which the U. S. Trucking has, is confined to transfer of freight between railroads or to steamship piers or waterfront warehouses, i. e. that no freight is drayed under the contract which requires a movement beyond the free lighterage point and thus no constructive delivery through lighterage points is given.

Replying to Traffic Manager Chandler of the Merchants' Association, Mr. Daniels said that he personally favored store-door collection and delivery for New York and agreed that such a plan would be the best stabilizer of trucking practice and charges obtainable. Questioned on this point by Examiner Ames, the witness thought that only one trucking agent should be employed by each carrier under a store-door service plan but immediately conceded that the work could be divided by having one concern handle inbound freight and another haul the outbound tonnage. Examiner Ames closed his questioning of Mr. Daniels with an inquiry into the witness' experience with the public loaders on New York piers.

At this point Deputy Manager Wilson of the Port Authority was recalled for brief testimony regarding the loading charge which, in his previous testimony, he had advocated on freight delivered through constructive stations. Mr. Wilson stated that the two cents per 100 lb. which he mentioned in his original testimony was simply an arbitrary figure used for convenience. Accordingly he introduced figures resulting from a Port Authority study of loading costs, which indicated an outlay by the carriers for loading on New Jersey team tracks of slightly more than one cent per 100 lb. He was cross-examined briefly and agreed to file the detail of the study in the form of an exhibit.

The Brooklyn Eastern District Terminal was the last of the participants to present evidence. Its case opened with the testimony of several patrons, each of whom expressed satisfaction at the service of the terminal, and closed with that of President Henry O. Havemeyer and H. H. Shepard, vice-president and general manager. Testimony of truckmen who serve the terminal patrons was also presented. One stated that he served a former patron of Brooklyn Eastern District at a rate of five cents per 100 lb. but had lost the business when the patron had received a three cent rate under a railroad's trucking in lieu of lighterage plan. Each of the terminal officers testified that considerable business has been lost because of the railway trucking practices. After brief cross-examination these witnesses were excused.

# Steam Railroads Electrification

THE report of the electrification of steam railroads committee of the National Electric Light Association was presented before the annual convention on June 6, 1928, at Atlantic City, N. J., by Britton I. Budd of the Public Service Company of Northern Illinois.

The committee has continued its activities through the past year in conformity with the program adopted in 1926, as follows:

"1—To study railroad electrification in a general way, avoiding technical details. 2—To analyze railroad electrifications already made and to develop the fundamental reasons for, and the results of, these electrifications. 3—To promote cooperation between the executives of railway and power companies in order to develop a clearer understanding of each other's problems and requirements in connection with railroad electrification."

It was recognized at the outset that this program would require a number of years for its development and completion. During the past year, the committee succeeded in getting its work better organized and made real progress in the development of its program. The three principal items of accomplishment this year are: (1) the employment of a secretary, (2) the extension of the statistical studies, and (3) a special report on one of the outstanding railroad electrifications of this country made by an independent investigator.

### Employment of a Secretary

When the program of the committee was definitely decided upon, it was realized that the work must be continually prosecuted without any lapses and that it would be necessary to arrange for some one to devote practically all of his time to making the requisite studies. It was finally decided to employ a permanent secretary and establish a regular office from which to conduct the committee's work. The committee secured the services of Horace H. Field, who has had many years experience in the electrical and public utility industries, including a great deal of economic research and involved statistical studies. During the past ten years most of his time has been used in research for various committees of the National Electric Light Association.

The secretary's office is in Chicago, Ill., at the same address as the chairman, which is conducive to keeping all branches of the work in proper harmony. The new arrangement will enable the committee to render continuous and effective work throughout the year and permit the broadening of its activities on a scope that would otherwise be impossible in following the development of electrification all over the world.

It is the intention of the committee to make its office a collecting point for information in regard to electrification. It should become, in time, one of the principal depositories for complete and authentic general information on the subject. The information collected will be kept readily available for the use of both railroad and public utility industries and for others who are properly interested in such research.

The condensed analysis of railroad electrifications, which appeared in last year's report for the first time, has

been considerably amplified by the addition of more roads and mileage. The analysis includes practically all trunk line electrifications in the world and lists route mileage, track mileage, type of system used, year electrified, traffic affected, reasons for electrification and results of electrification. It was originally compiled through the medium of technical publications covering the 33 years of history of electrification. During the last year much additional information has been accumulated and work started on securing such information directly from the railroads. The information regarding American railroads has all been submitted by the railroads themselves. This is also true of some of the foreign roads, although considerable dependence has been placed on other statistical sources for foreign information. Ultimately the statistics developed by the committee will all represent original data secured directly from the proper parties.

A new table is submitted in this year's report entitled "Physical Characteristics of Operation on Electrified Sections of Steam Railroads." It is complete for the United States and Canada and includes railroads in seven countries outside of North America. It lists track gage, miles electrified, number and aggregate length of tunnels, ruling grades against traffic, length of grade, maximum curvature on grade, number and maximum weight and power of passenger locomotives, freight locomotives and motor cars, number and weight of passenger trailers, car capacities, average number of passenger and freight trains daily, cars moved daily, average schedule speeds, car miles per year, ton-miles freight service and data concerning source and use of electric power.

All of the American railroads replied to requests for this information. Replies from abroad are being gradually received, and those on file have been tabulated. The 1929 report should be nearly complete for all countries of the world with authentic information supplied by the railroads themselves.

### Special Report on Electrified Road

It is the intention of the committee to submit each year some special analysis or investigation of one of the outstanding types of railroad electrification. For this year's report the Virginian Railway was chosen because of the popular interest which attaches to heavy tonnage operation.

As it was desired particularly to have the views of an independent investigator who had not been connected with this project, a railroad executive from another part of the country was selected. F. L. Johnson, assistant to vice-president operating department, Chicago, Burlington & Quincy consented to examine and report on the operations of the Virginian. Mr. Johnson has the background of 50 years of operating and executive experience on one of the largest and most efficient railroad systems of the middle west. He spent a week examining the electric and steam operating divisions of the railroad, accompanied by a small group from the committee.

Mr. Johnson's report was included as an appendix and represents entirely his views and conclusions. It effectively describes the operation of the railroad from a transportation standpoint and closes with the following statement:

"In 1924 (the last full year previous to electrification) The Virginian Railway Company's cost of conducting transportation was 27.08 cents per hundred net ton-miles, with total operating cost of 64.30 cents, while in 1927 (the first full year subsequent to electrification) the cost of conducting transportation was 20.01 cents, with total operating cost of 52.47 cents. This shows a decrease in operating cost of 11.83 cents per hundred net ton-miles, or 18.4 per cent. The net tons moved one mile by the Virginian Railway in 1924 was 3,034,366,000, while in 1927 the net tons moved one mile was 3,246,964,000. Applying the difference in operating cost of 11.83 cents per hundred net ton-miles to the tonnage moved in 1927 indicates a saving of $3,841,158.41.

"The figures quoted above represent the saving in total operating costs as between the years 1924 and 1927. I am unable to determine what part of this saving can be attributed directly to electrification and what part is due to other operating economies not associated with electrification.

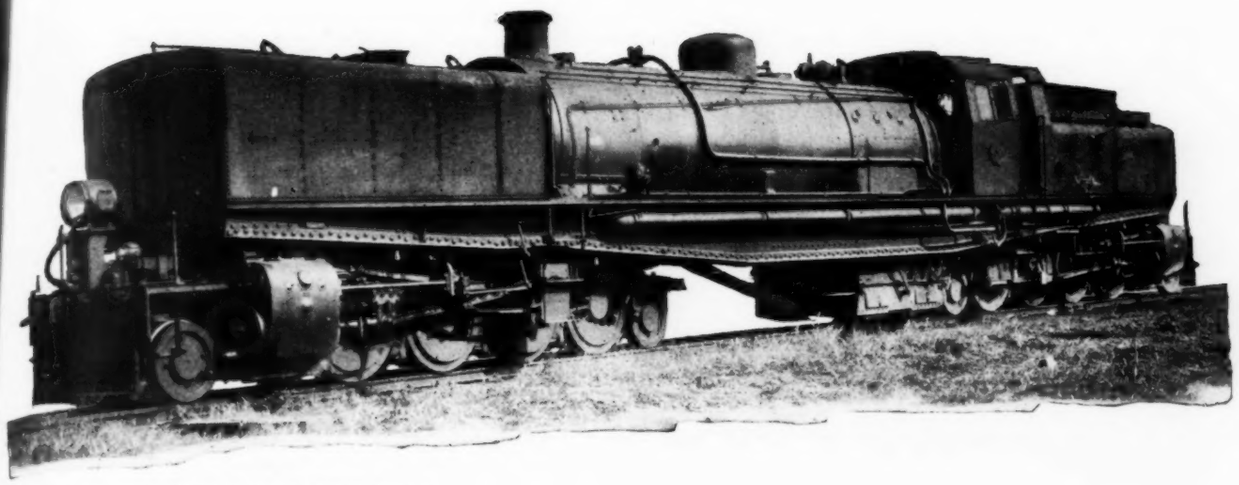
"In my opinion, there are few, if any, railroads with normal conditions as to class, direction, and density of traffic that would be warranted in electrification on a scale comparable with that which the Virginian Railway has accomplished. I question if any railroad having normal grades and operating conditions and handling a general business, such as is handled by the average railroad, in all kinds and classes of equipment, would be warranted in incurring the expenditure made by the Virginian. It was apparently economical for the Virginian, in view of its special operating conditions, class and trend of traffic, to do so."

### Illinois Central Electrification

Supplementing the presentation of the committee report, the association was addressed by L. A. Downs, president of the Illinois Central. Mr. Downs reviewed briefly the history of electrification in the United States giving special attention to the manner in which the history of Chicago's Lake Front led up to the electrification of the Illinois Central. The installation, he said will eventually include 420 miles of track including both passenger and freight service. Other improvements were included in the electrification program, he said, and cited as an example the separation of grade crossings which could be made much more easily before the overhead was erected than after. He gave as the reasons for purchasing rather than generating power, saving of a large investment, avoiding the necessity of building a plant large enough to take care of peak loads, difficulty of keeping railroad power plant up to date and the increased dependability of power supply assured by having more than one connection with the power supply. Traffic, he said, had increased by one-third, which was a considerably greater increase that was expected. One of the reasons given for it was that the improved service has increased the desirability of outlying suburban districts.

With regard to the economics of the situation, Mr. Downs said that increased revenues caused by increased patronage does not warrant the cost of the installation, but has served to change an operating deficit to a profit. He expressed the hope that with further increase of traffic and use of overhead rights, the installation would be justified economically.

Mr. Downs called upon the National Electric Light Association to assist in the progress of electrification by stating that while it was not desirable to use only one system of electrification, the N. E. L. A. could assist in promoting standardization and in assisting the railroads to raise the money necessary for making savings by electrification. This latter point he elaborated on by a short talk on railroad rate structure and regulation, dwelling in particular on the importance of allowing the railroads to earn a fair return on investment. He concluded his talk by saying that both the power companies and the railroads must endeavor to win and to merit public confidence.



*A Garratt Locomotive Used in Heavy Freight Service*

# South African Railways Do Well

## *Lines noteworthy for development work—Have extensive highway services—Electrification progresses*

By Sir William Hoy, K.C.B.

General Manager, South African Railways and Harbors*

IN proportion to population few countries have so many miles of railway as exist in the Union of South Africa, a country six and a half times the size of Great Britain and Ireland, and their importance as a national asset and an industry will be appreciated from the fact that at the end of the last financial year, which terminated March 31, 1927, the amount of capital expended on the undertaking, including subsidies, etc., to privately-owned railways and new lines under construction, stood at over 129 million pounds or 628 million dollars, while the revenue earned during the financial period capped the 24 million pound mark and exceeded by approximately 4¾ million pounds or 23 million dollars the gross operating expenditure which amounted to close upon 19½ million pounds. The net result after meeting all expenditure on operating and under net revenue account, including depreciation and interest charges, was a surplus of £262,514, or $1,278,443.

While the comparison of the results of operation with the previous year's figures shows that the earnings in the aggregate were not so high, a fact wholly attributable to the decreased production of agricultural commodities as a consequence of the unfavorable weather conditions experienced, there was considerable improvement under the heading of general traffic and in certain other respects the results far exceeded previous records achieved. For instance, the peak point was recorded during 1926-27 in passenger traffic, revenue-earning coal traffic and livestock traffic.

### Railway Statistics

The train mileage run, 45,547,644 miles, constituted a record and compared with the previous year's figure was greater by 1,218,414 train miles.

The number of passengers carried totaled 80,084,249 representing an increase of 3,801,662 compared with 1925-26, in which year the previous record was established.

The open mileage of government-owned lines at the close of the past financial year totalled 12,206 as compared with 11,995 miles on March 31st, 1926, an increase of 211 miles, but it should be mentioned that the actual mileage operated by the Administration within the Union and South-West Africa, including lines leased or operated on behalf of private companies, aggregated 12,624.

To illustrate the progress which has been made since December 31, 1909, the year preceding the unification, consummated on May 31, 1910, of the four Provinces; the Cape, Natal, the Transvaal and the Orange Free State, the following comparisons will suffice.

| Item | Year ended March 31st, 1927 | Year ended December 31st, 1909 | Percentage increase |
|---|---|---|---|
| Capital cost of railways (lines in operation) | £128,024,206 | £73,066,830 | 75.22 |
| Railway staff (excluding casuals, etc.) | 81,476 | 39,564 | 105.93 |
| Train mileage | 45,547,644 | 19,662,444 | 131.65 |
| Number of passengers | 80,084,249 | 28,191,135 | 184.08 |
| Coal traffic (revenue-earning) (tons) | 10,118,773 | 5,197,374 | 94.69 |
| Total freight traffic conveyed (tons) | 24,968,965 | 10,268,074 | 143.17 |

The railways have been a predominant factor in the rapid development of South Africa's numerous industries, agricultural, mineral and commercial, linking up as they do the main centres of settlement and activity with the principal ports.

During the year, 5,266 vessels of a gross register tonnage of 24,186,194 entered the ports, these figures, both in respect of the number of vessels and tonnage being the highest on record.

### Tariff Policy

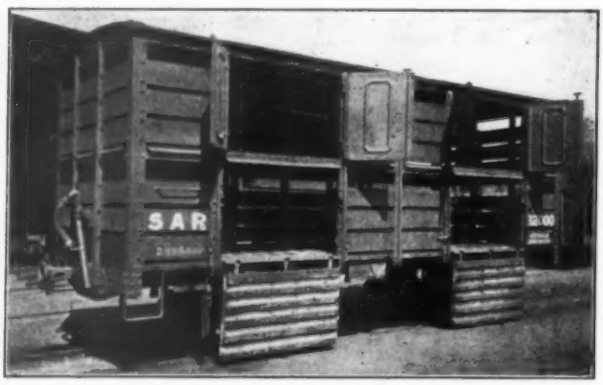
In pursuance of the Administration's policy of lowering rates wherever possible certain reductions in

* Since this article was written Sir William has retired from this position.

freight tariffs, confined mainly to agricultural produce, were effected immediately prior to the commencement of the financial year under review. Reductions during the 1925-26 period were also effected in main line passenger fares for distances under 100 miles.

### Railway Electrification

By June, 1926, work of converting 175 route miles of the Natal main line from steam to electric traction had progressed to the point permitting the introduction of a full electric service between Glencoe and Pietermaritzburg—the first work of railway electrification undertaken in South Africa.

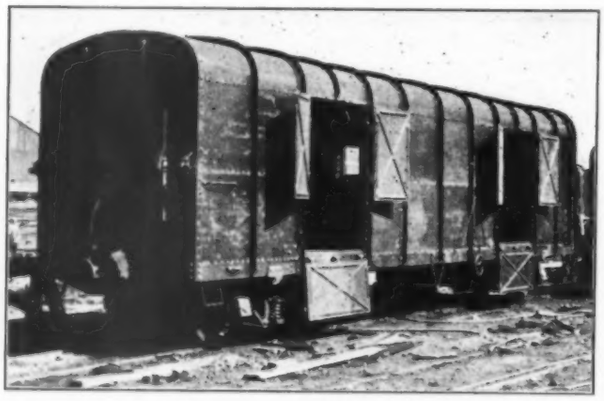



Double-Decked Sheep Car

With the completion during the year under review of the new intake works at the Colenso power station and the Tugela river barrage the construction program for the electrification of this section of line has been successfully concluded. The whole installation as now completed is designed to handle a daily tonnage of 30,000 in addition to the passenger service.

The results already achieved under electrification conditions of operation have proved conclusively that the success of the Natal scheme is assured.

Work on the electrification of 62.6 miles of line in the Capetown suburban area also proceeded during the year under review.



South African Railways' Steel Grain Car

The Cape Town—Simonstown electrification scheme (54.7 miles) has involved such work as the substitution of subways for overhead bridges, widening of distance between tracks, alterations to platforms, and double-tracking of the line from Muizenberg to Fish Hoek.

The work of electrification, which is being executed departmentally, is making satisfactory progress. The Monument—Sea Point electrification (7.9 miles) is so far completed as to permit of the running of an electric service which was introduced in October, 1927.

### The Grain Elevator System

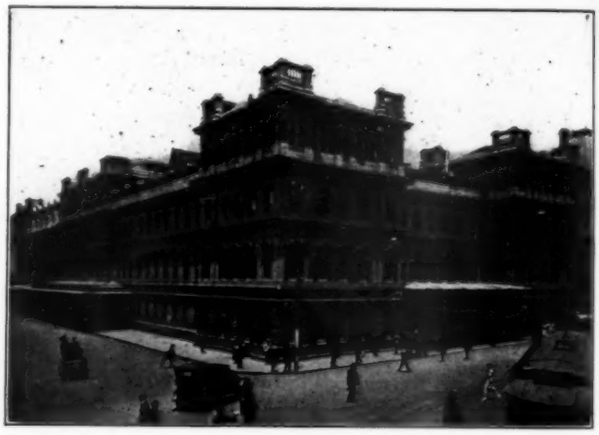
The grain elevator system has been established by the Administration for the handling, in bulk, of grain for export and for local trade.

The total number of elevators at present in service is thirty-seven, of which thirty-five are country elevators located at stations in the principal maize producing districts and two port elevators one at Capetown and the other at Durban. The total storage capacity of the elevators is 182,950 tons and the Durban elevator, which was only placed in full commercial operation in August last, with its storage capacity of 42,000 tons, is the largest and is capable, as is also the Capetown elevator, of handling bulk grain at the rate of 1,000 tons per hour.

An additional 1,000 bulk grain cars have recently been placed in service making available altogether 2,003 cars of 40 tons carrying capacity for transporting grain in bulk from the country to the port elevators.

### Road Motor Services

Another outstanding feature of the Administration's progressive activities is the extension of its road motor system of transport in rural areas. That its development has been remarkably rapid will be appreciated from the fact that at the close of the 1924-25 financial year only eight services were in operation, whereas nineteen districts were being served by this system of transport on March 31, 1926, when the total route mileage over which departmental road motor services were being operated was 1,551, an increase compared with that of the previous year of 1,050 miles. By December 31, 1926, the mileage in operation had increased to 3,385 and three months later, March 31, 1927, the mileage had reached the 4,282 mark. Thus during the twelve months under review the increase in the route mileage traversed by departmental road motor services aggregated 2,731 miles. But at the time of writing further services representing 946 route miles have been introduced which brings the total mileage to date up to 5,228.



Capetown Railway Station

The provision of these services has gone far towards obviating the necessity for the construction of unprofitable branch lines in districts whose development is ham-

ered by lack of adequate transport facilities. The aggregate mileage run by the Administration's road motor service vehicles during the year was 1,218,793.

### New Types of Cars and Locomotives

Recently the administration placed an order, for experimental purposes, for two three-cylinder locomotives with a 2-10-2 wheel arrangement to be capable of developing a maximum tractive effort of 53,200 lb. At present the most powerful non-articulated steam locomotive in service on these railways has a tractive effort of 40,744 lb.

Two Diesel engines, for trial purposes, are also to be obtained, one of 1,000 h.p. for the 3 ft. 6 in. gage and the other of 300 h.p. for the 2 ft. gage. These engines are to be used with a view to improving the financial results of branch line operation where conditions under steam are too unfavorable and uneconomical.

As an instance of rapid transport it is noteworthy that before the Union the fastest passenger train between Cape Town and Johannesburg, a distance of 956 miles, occupied 43 hours, 50 minutes, whereas the scheduled time to-day of 29 hours is consistently maintained. Johannesburg has also been brought nearer to the Union's eastern port—Durban—by several hours.

A dynamometer car was added to the administration's equipment during the year. The car has a maximum capacity of 350,000 lb. draw-bar pull and a maximum draw-bar buff of 1,250,000 lb. There is no doubt that


**Types of Highway Motor Coaches in Service**

**Natal Electrification—Diamana Station Yard**

the car will prove a factor of great economic importance particularly when it is considered that the administration's annual coal bill is in the neighborhood of £900,000.

Orders were placed during the year for 25 first class articulated main line parlor cars for use on the "Union Limited" and "Union Express" trains. These cars possess many features that are absent from the existing standard type of compartment coaches. These cars were placed in service towards the end of 1927, along with new observation cars and baggage cars of the ordinary type which are to be used in conjunction with the articulated cars.

Twenty 70-ton cars were placed in service during the year, the individual carrying capacity of which is greater by 20 tons than that of the largest freight cars so far employed. These vehicles are being employed with a view to determining the possibilities of high capacity cars for the handling of coal.

### Construction of New Lines

Owing to the impossibility of obtaining the necessary material new construction was not proceeded with during the period of the war but since its termination an active policy of new railway construction has been steadily pursued, programmes having been authorized during the 1922, 1924, 1925 and 1926 sessions of Parliament.

These programmes comprised in all a length of approximately 2,000 miles of new lines and satisfactory progress has been made with their construction. On March 31, 1927 slightly over one thousand miles had been opened for traffic and from the close of the year up to the beginning of July a further 104 miles had been completed.

### Tourists From Overseas

Every year brings an increasing number of tourists to South Africa. Among them are many visitors from America. In 1928, five touring vessels from that country and Canada will arrive at South African ports and special trains will be placed at their disposal to tour the country. A tourist department has been established with branch offices at Capetown and Durban in order effectively to deal with the traffic from overseas and to enable South Africa to render efficient and up-to-date service to the visitors.

### Labor Conditions

The number of employees in the service of the Railways and Harbors Administration on March 31, 1927, was 94,756, of whom 81,476, as already stated, are employed on railways. Of the total number of Railway and Harbor employees 54,579 are Europeans and 40,177 non-Europeans. Compared with the number of employees at the end of the previous financial year an increase of 2,330 is reflected in the former class and a decrease of 4,728 in the latter class of employee.

The Administration has established a board of conciliation on which the staff is fully represented and the effect of it has been to maintain harmonious relationship between the administration and its staff.

A policy has also been pursued of periodically holding conference with representatives of various classes of employees which has gone far to foster and maintain a spirit of co-operation by all in the interests of the service.

# *Looking Backward*

## Fifty Years Ago

The agreement among the lines from Chicago to New York not to pay commissions to outside agents has not been maintained, and today a traveler can go into any "scalping" office in Chicago and buy a ticket on any line to the east for $1.50 less than he will be charged at the railroad office. He merely has to wait while the scalper runs around to the regular agent, and buys it for $2 off.—*Railway Age,* June 13, 1878.

Action by Congress on the bill to extend aid to the Texas & Pacific has been postponed until the next session. A vice-president of the railroad has announced that there will be no extension of the line until after Congress shall act on the bill. In case the congressional aid is granted it is the intention of the company to complete its railroad through to the Pacific ocean from Ft. Worth, Tex., within five years.—*Railway Age,* June 15, 1878.

The Union Pacific has secured practical control of the Kansas Pacific for a period of 50 years and a pooling agreement has been concluded whereby the earnings of four railways will be divided in the proportion of 73 per cent to the Union Pacific, 3 per cent to the Omaha Bridge Company, 4 per cent to the Colorado Central and 20 per cent to the Kansas Pacific. The agreement also provides that the four railroads shall be managed as one property.—*Railroad Gazette,* June 14, 1878.

## Twenty-Five Years Ago

Arthur H. Fetters has been appointed assistant mechanical engineer of the Union Pacific, with headquarters at Omaha shop, Neb.—*Railroad Gazette,* June 19, 1903.

The Canada Southern, operating 459 miles of line, has been leased by the Michigan Central for 999 years. The Michigan Central guarantees 2½ per cent dividends on Canada Southern stock until 1910 and 3 per cent after that date.—*Railway and Engineering Review,* June 13, 1903.

As a part of its exhibit at the St. Louis World's Fair the Pennsylvania will install and have in operation a locomotive testing plant. It is planned to set up the apparatus in duplicate so that no delays will occcur while locomotives are being taken in and out.—*Railroad Gazette,* June 19, 1903.

The New York Connecting Railroad Company has asked the Rapid Transit Commissioners of New York for a franchise permitting it to build a line from the Bay Ridge terminal of the Long Island across Hell Gate, providing a through rail line from the West through Manhattan into the New England states when the Pennsylvania-Long Island tunnel is completed. —*Railway Age,* June 19, 1903.

## Ten Years Ago

Because of high prices, which make the use of anthracite coal almost prohibitive as locomotive fuel, the Lehigh Valley is utilizing a mixture of anthracite silt with coal on its Mahanoy and Hazleton divison where huge culm banks, consisting of shale, rock, dirt and mine refuse, are available. Chemists of the Lehigh Valley determined that a ratio of 65 per cent bituminous to 35 per cent anthracite silt gives the best results.—*Railway Review,* June 15, 1918.

The railroads in the Western region have been divided by the United States Railroad Administration into three regions, the Northwestern, the Central Western and the Southwestern. R. H. Aishton, hitherto regional director of the Western region, was appointed regional director of the Northwestern region, with jurisdiction over the railroads from Chicago to the North Pacific Coast, and Hale Holden was appointed director of the Central Western region, with jurisdiction over railroads in the territory from Chicago to the Pacific coast.—*Railway Age,* June 14, 1918.

# New Books

*Universal Directory of Railway Officials, 1928. 389 pages. 5¼ in. by 8¼ in. Published by the Directory Publishing Company, Ltd., 33 Tothill St., Westminster, London. Price $5*

This new edition of the Universal Directory, a volume containing lists of officials of railroads in Great Britain, Europe, Africa, Asia, Australasia, North, Central, and South America, brings these lists up to date, and, in the case of officers on British, Indian, South American, African, Colonial or foreign railroads, the lists have been completely revised. The volume is in its usual form, giving in the instance of each railroad the name, the number of miles of line operated, the gage, the equipment, and the principal executive, financial, secretarial, engineering and operating officers. The volume is carefully indexed by officers of all the railroads reported in the book, and also is indexed to show the names of railways, railway institutions and associations. The volume is completed by a list of manufacturers and retailers of railway equipment, supplies, stores, machinery and tools.

## Books and Articles of Special Interest to Railroaders

*(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)*

### Books and Pamphlets

*R. A. O. A. Overcharge and Agency Relief Claim Rules, 1929 Edition.* Effective June 4, 1928. Foreword outlines arbitration procedure. 132 p. Pub. by Railway Accounting Officers Association, Washington, D. C., $1.

*The Pinto Horse,* by Charles Elliott Perkins. A railroader has written a horse story that more than holds its own among the great stories of its kind. Illustrations by Edward Borein. 76 p. Pub. by Wallace Hebberd, Santa Barbara, Calif., $2.50.

*The Intelligent Woman's Guide To Socialism and Capitalism,* by Bernard Shaw. On page 275 or so, a solution for the railroad problem is set forth (a "Railroadmaster-General") in the midst of a vivid and lively display of economic fireworks. 470 p. Pub. by Brentano's, New York City. $3.

*Proceedings of the 39th Annual Convention of the National Association of Railroad and Utilities Commissioners 1927, Dallas, Texas.* Includes addresses and reports on valuation, motor transport, consolidation, state and federal regulation, grade crossings, and government ownership. 596 p. Pub. by the Association, New York City. $5.

*Commodity Prices in Their Relation to Transportation Costs. Bulletin no. 28, Potatoes (White),* and *Bulletin no. 29, Live Stock, No. 29,* the 4th in a series, covers main crop of 1926 and early and 2d crops of 1927. Nos. 29 is a study of sales at 10 large live-stock markets. 24 and 8 p. Pub. by Bureau of Railway Economics, Washington, D. C., *Apply.*

### Periodical Articles

*Locomotives,* by Thornton Oakley. Text and illustrations by author. American Federationist, June 1928, p. 670-671.

*The Reserve and Railroad Acts.* Comment on attempts to cite them as precedents for farm relief bill. National City Bank of New York Letter, June, 1928, p. 96.

*Forty Years of Land-Cruising,* by Charles M. Fleischner. "It is now forty years since Raymond-Whitcomb first asked Mr. Pullman to build that famous 'vestibuled train,' prize packet in the travel annals of 1887." p. 18. Illustrated from old photographs of trains and terminals. World Traveler, June 1928, p. 18-19, 44-45.

*Modernizing the Suburban Transit of the Metropolitan District,* by Francis Lee Stuart. "In 1927 the suburban railroad traffic from the Metropolitan District into and through Manhattan, exclusive of subways and local ferries, was more than 38 per cent of all passengers entering railroad passenger cars in the whole United States, including Alaska." p. 1391. Proceedings of the American Society of Civil Engineers, May 1928, part 1, p. 1391-1393.

# Odds and Ends

Railway men seem to have distinct musical inclinations. In support of this, there is John Hanrahan, boilermaker in the Illinois Central shops at Fort Dodge, Iowa, and Abram Livingston, car repairer, Grand Trunk Western, Port Huron, Mich., both of whom have recently won first prizes in "Old Time Fiddlers" contests held in their communities. Hanrahan, it might be mentioned, also won first prize recently in a chicken calling contest.

The Northern Pacific has outstanding a pay check drawn in the amount of five cents which has remained uncashed more than 44 years. On November 1, 1883, J. H. Wise, now a passenger conductor, was a brakeman on a way freight between Fargo, N. D. and Detroit, Minn. That was less than two months after the golden spike completing the transcontinental line of the Northern Pacific had been driven. He had received his regular pay check but in the computation he had been underpaid for overtime. Therefore, the five cent check still is in his possession. He now is 69 years old and has been in the employ of the railroad since 1882. The check relic was dated at St. Paul and is shown to be on roll number 140, line number 17 of the Northern Pacific Railroad Company, the former name of the Northern Pacific Railway Company. The steel engraved background of the check evidently was intended to portray the scope of the lines of the railroad company between St. Paul and the Pacific coast. At one end is shown the capital city of Minnesota with the capitol in the distance along the Mississippi river, then through the more level lands of the Dakotas into the mountain and forest country of the west.

### A Roadmaster Strikes His Lyre

The secretary of the American Railway Engineering Association received a telegram from one of the committee members announcing that he would be unable to attend a meeting. This is not unique, but this particular telegram is the only one the secretary has ever received in verse. The telegram follows:

"Sorry to say,
Can't meet today,
Busy lining track,
Joint ahead and center back,
Don't wait so late,
For meeting date,
When most of us with jobs to do,
Are busy seeing traffic through."

### Railroading Up to Date

The men operating the freight trains of the Pennsylvania Railroad, if we may credit the enthusiastic comment of the editor of the Pennsylvania News, are very frequently entitled to medals, prizes or blue ribbons in recognition of their exceptional efficiency.

Two recent "events" on the Sunbury division are reported in the last issue of the News:

"J. K. Smith, conductor, one of the moving spirits in the effort of the crews to set standards of eight hour railroading, came to port, with his train, under circumstances that required his presence at the head end. With the train held for the conductor to come from the rear, Smith dropped off the cabin and started ahead.

"An automobile approached on the highway parallel to the track. Quick to seize any opportunity to avoid delay, Smith hailed the motorist, climbed aboard and dropped off at the engine, saving a precious five minutes in delay.

"George W. Keefer, passenger engineman, when his train was held by a signal because of a freight train ahead with knuckle broken, was not content to await developments; learning that the freight crew had previously used its emergency knuckle, Keefer had the knuckle removed from the front of his own engine and applied to the disabled car, clearing the situation up with a minimum of delay."

# NEWS *of the* WEEK

*Maine Central No. 29, Leaving Portland, Me.*

THE PACIFIC RAILWAY CLUB will hold its next meeting at the Palace Hotel, San Francisco, on June 21. The subject for discussion is "Public Relations" and the chief speaker will be Paul Shoup, vice president of the Southern Pacific.

THE SUIT OF THE PIEDMONT & NORTHERN to secure approval of its plans for an extension, is before the United States Court in South Carolina; and permission has been asked to appear as defendants, by the Southern, the Seaboard Air Line, the Atlantic Coast Line, the Charleston & Western Carolina, the Louisville & Nashville, the Carolina, Clinchfield & Ohio and the Clinchfield & Northern.

THE MISSOURI PUBLIC SERVICE COMMISSION has for the second time denied the application of the St. Louis-Kansas City Short Line Railroad Company for authority to construct an electric "interurban" line between St. Louis, Mo., and Kansas City. The Commission originally denied the application in May, 1925, on the grounds that not sufficient proof had been given of financial ability to build and equip the railroad; and it is now held that the promoters have not complied with the Commission's request for proofs, and this action is considered to be final and unconditional.

### Pennsylvania Prizes

The Pennsylvania announces that its Bureau of New Ideas, in the first six months of its career has received 1,499 suggestions from employees for improving the service. These are from employes in 127 different occupations and from all parts of the company's territory. A first prize of $100 was awarded to a store attendant; a second prize of $50 to a fireman and a third prize of $25 to a pipe fitter.

### I. C. C. Vacancy Filled

Patrick J. Farrell, chief counsel of the Interstate Commerce Commission, whose nomination for appointment as a member of the commission to succeed Commissioner Esch was not acted upon by the Senate before the adjournment of Congress, was given a recess appointment on June 7 by the President and he immediately took the oath of office. Commissioner Esch's recess appointment expired with the adjournment of Congress on May 29.

Mr. Farrell's recess appointment is good until the end of the next session.

### Railway Employment in April

The number of employees of Class I railways as of the middle of the month of April was 1,658,623, a reduction of 5.68 per cent as compared with the number in April, 1927, and of 7 per cent as compared with April, 1926. The reduction in the number of employees in the maintenance of way and structures group was 6.76 per cent and that in the maintenance of equipment and stores group was 6.52 per cent, while the number in the transportation group showed a reduction of only 5.64 per cent, as compared with April of last year.

### Baldwin to Open New Administration Building

Ceremonies marking the complete transfer of the Baldwin Locomotive Works business departments from Philadelphia to the new administration building, recently built at the Eddystone plant, will be held on June 28.

A special program of speeches and plant inspection tours has been arranged by a committee composed of President Samuel W. Vauclain and other Baldwin officers and directors.

Prominent railway executives of United States, representatives of railways of Canada, Mexico, Chile, Cuba and European countries, as well as several public officials, are expected to attend. Among the speakers will be James J. Davis, secretary of labor, and Judge Albert Dutton MacDade of Delaware. Special trains will convey guests from the Atlantic City railway conventions and from New York and Philadelphia.

### Release is Final Settlement

Where a railroad employee is injured and claims damages under the Federal Employers' Liability Act, and then settles with the railroad, executing a general release, and subsequently dies as the result of his injuries, the Supreme Court of the United States holds, reversing 121 Kan. 392, that, the settlement, having been made advisedly and in good faith, bars an action by dependents for their pecuniary damages through his death. Any claim for the employee's personal loss and suffering having been settled, he, immediately before his death, had no right of action; and nothing passed to his administratrix because of such loss or suffering.—Mellon v. Goodyear. Decided May 23, 1928. Opinion by Mr. Justice McReynolds.

### Baltimore & Ohio Telegraphers Get Better Pay

The Baltimore & Ohio, following a report of arbitrators, has advanced the pay of telegraphers, to take effect as of May 15, by 3¼ cents an hour for those who are paid by the hour, and by five per cent to those paid by the month. The decision affects 2,200 operators and is to hold good for one year. J. F. Miller, one of the directors of the Order of Railroad Telegraphers, who was a member of the arbitration board, filed a dissenting report. The arbitrator on behalf of the railroad was E. W. Schweer, general manager of the eastern lines, and the third arbitrator was F. H. Kreisman, former mayor of St. Louis, Mo.

The telegraphers had asked for one day off in every 14 days, and also that those who have been in the service one year or more and are working six days a week, be allowed a vacation of 15 days annually with pay, but these requests were denied.

### Harriman Memorial Medals for 1927 to be Awarded

The committee of award for the Harriman Memorial medals has announced the conditions which will govern the awards to the railways with the best safety record during the year ended December 31, 1927. Since the 1926 medals were awarded, a number of additional suggestions, factors and formulas have been taken into consideration. These have been given careful consideration, resulting in the following changes in the rules governing the awards:

**All casualties to employees on duty will be combined in one group, and will be rated per million man hours. This will, it is felt, give consideration to the varying factors of risk in**

the several districts, such as man hour exposure, traffic density, and the like.

Casualties to "all other persons" will be rated per 250,000 locomotive miles, thus reducing the weight of that class of casualties.

Employees not on duty will be included in the "all other persons" group, and rated with them per 250,000 locomotive miles, no man hours being recorded for employees not on duty

No change has been made in the method of rating casualties to passengers in trains and in train service accidents.

As in the past, the official summaries and records of the Interstate Commerce Commission will be used as a basis for determining the awards. The committee, however, may take into consideration other safety and welfare work contributing to, and tending to promote, the prevention of loss of life and accidents and the enhancement of the safety cause in general. As in past years, the carriers are invited to report any special work of this nature which they would like to have considered.

## Sleeping Car Strike Postponed

Acting upon the advice of William Green, president of the American Federation of Labor, the threatened strike of the Brotherhood of Sleeping Car Porters which had been set for June 8 was "postponed" on June 7 until a later date. Mr. Green advised organizers of the brotherhood that "economic conditions are not favorable to the success of a strike now. Public opinion has not been crystallized to approval of your demands." The United States Board of Mediation refused to recommend to President Coolidge the appointment of an emergency board of arbitration.

The Pullman Company issued a statement on June 8 calling attention to the fact that an agreement with the porters and maids is now in force. The statement is as follows:

"The Pullman Company has no dispute with its employees. As a matter of fact, it has an agreement with its porters and maids which complies with the letter and spirit of the railway labor act. In that contract it is provided that either party, if it should desire to revise the agreement, can make a written statement containing the proposal, which shall be submitted to the other party and a conference must be held within 30 days to discuss and determine the matters brought up for revision. The agreement also may be terminated by either party giving written notice to the other, and upon receipt of such written notice it shall terminate 60 days after the giving of such a notice.

"Since this agreement, a continuation of one several years older, was signed on February 15, 1926, there has been no request from the employees of the Pullman Company for any revision, nor has any notice been served upon the company by the porters for cancellation of the contract.

"The strike movement fostered by agitators, who are not employees of the company, is an attempt to induce and persuade the employees of the Pullman Company to violate their contract with the company, especially so in view of the fact that the agreement provides there shall be no strike or lockout.

"Under the plan of employee representation through which this agreement was made, elections are held annually. The agitation started in 1925. That year 83.4 per cent of the porters and maids voted under the plan. In 1926, 85.1 per cent voted, and in the fall of 1927, when the agitation was at its height, 96.6 per cent voted.

"Scores of porters arriving at the end of their runs in Chicago and elsewhere notified their superintendents that they had no intention of striking and would take out their cars and complete their runs as usual."

## Lively Debate on C. N. R. in Canadian House

Near the conclusion of the present session of the Canadian Parliament Hon. R. B. Bennett, leader of the Opposition, got into a verbal duel last week with the Minister of Railways, Hon. Charles A. Dunning, over the manner in which the financial performance of the Canadian National was submitted to Parliament. They also warmly debated the question of the Halifax hotel deal. Some time ago there had been discussion of a new hotel at Halifax jointly operated by the Canadian Pacific and Canadian National. Eventually, the Canadian National, disliking the financial features of the deal withdrew and are now building one of their own at their terminal station. The people backing the other project, the Lord Nelson hotel, with whom are included the Canadian Pacific, are critical of the decision of the Canadian National to build one of their own when the Nelson backers say there is not enough business for two new hotels.

Sir Henry Thornton, head of the Canadian National, says he is convinced the National hotel will pay.

On the question of the Canadian National figures Mr. Bennett said, in part:

"We are asked to vote some $39,000,000 to this railway system, and a very considerable part of that amount will be required to take care of obligations which already have been partly incurred. That is abundantly clear. We are now meeting the obligations of this railway system in two ways: For some years we made direct advances out of the treasury, advances of $7,000,000, $10,000,000, and $15,000,000 out of our revenues. We taxed the people of the country for this money, which was put in the general consolidated revenue fund and then paid out to this railway company. Then we adopted another course, that of guaranteeing security and enabling the railway company to borrow the money themselves. There was still another method adopted at one time, by which we issued our own securities, received the money and handed it over to the railway company. This is the second time this year we have been called upon to vote money for this enterprise; the first item was in the supplementary estimates with respect to 1928, when we appropriated certain sums of money to make good the requirements of the undertaking. Now we are called upon to vote the very large sum of $39,000,000.

"The Canadian Pacific Railway Company, which is the great competitor of this system, asks its shareholders for additional money by placing before them in the annual report which is presented to them, and which they receive before the meeting, a complete statement showing just for what the money will be required. I submit that parliament should have before it in the statute in detail the very same information given the shareholders of a privately owned enterprise in connection with its requirements."

Replying to these remarks Mr. Dunning said:

"I have no criticism whatever to offer of the Canadian Pacific report to their shareholders; that is the business of that company and I have no doubt the shareholders are satisfied with it. But for my hon. friend to pretend for one moment that the shareholders of this enterprise, the Canadian National Railways, through their representatives in parliament, do not receive a very great deal more information about their property than is received by any shareholder of the Canadian Pacific Railway is an insult to the intelligence of this house. A special committee considered this report for days; the meetings of that committee were open to members of this house, and except for a portion of one session the meetings were open to the public as well. . . . As a matter of fact the competitors of the Canadian National both in the United States and in Canada in the very nature of things have a very great deal more public information respecting the activities of the Canadian National than it is possible for the Canadian National to secure with respect to these competitors."

## Superintendents Meet

More than two hundred members of the American Association of Railroad Superintendents met in the thirty-fifth annual convention at Memphis, Tenn., on June 12-15. The convention, which was presided over by President J. M. Walsh, division superintendent of the Illinois Central, Memphis, Tenn., was opened by addresses by L. A. Downs, president of the Illinois Central, and Samuel O. Dunn, editor of the *Railway Age*. Tuesday afternoon was spent in consideration of the operation of trains by signal indication, papers being presented by officers of the New York Central, the Missouri Pacific, and the Central of Georgia, describing installations on those roads, the first being supplemented by motion pictures.

Following these, papers were presented giving the results of the installation of automatic signals on the Arkansas division of the Missouri Pacific and of an analysis of the estimated results possible from an installation of dispatcher controlled signals on the Southern Pacific. Wednesday was devoted to the consideration of reports of committees on expediting car movements through yards, speeding train movement by signals, "19" train orders, etc., public relations, reduction of damage to freight and safety. The annual banquet was held on Thursday evening.

Thirty-five railway supply firms pre-

sented exhibits, this being a new feature of this convention.

### "Safety to the Utmost"

The foregoing is the slogan proposed by the Committee on Education of the Safety Section, A. R. A., in its circular to the railroads outlining its program for the month of July. The proposal to reduce accidents in seven years, from 1923, to the extent of 35 per cent, means that a reduction of 20 per cent should have been attained by the end of 1927; and, calling attention to the fact that 76 railroads have already attained a reduction of 35 per cent or more; and that 43 have accomplished from 20 per cent upward but not as much as 35 per cent, all are urged to keep up their enthusiasm.

Chairman Bentley's circular consists mainly of comparisons between 1923 and 1927, showing what has been accomplished in four years. Passenger casualties have been reduced 20.2 per cent per million passenger miles, but this includes accidents from all causes; in train accidents alone, the reduction is 35.7 per cent. As the reader is aware, the reduction in passengers *killed* in train accidents in 1927 was phenomenal, the total, 10, being far below any previous record.

The reduction in the number of employees killed and injured per million man hours, all causes, from 1923 to 1927, was 42.1 per cent; in train accidents 36.5 per cent. The number of man hours worked shows a diminution of 9.3 per cent. While, however, the number of employees *injured* per million man hours fell off from 30.50 to 19.87 or about one-third, the number *killed* per million man hours shows a diminution of only about one-tenth; or from 0.38 to 0.34.

The number of persons killed and injured at highway crossings has increased, as everybody knows; but attention is called to the fact that the number of automobiles in use increased from 1923 to 1927 by about 50 per cent, so that there is really a decrease in highway crossing casualties per million automobiles of about 46 per cent.

### Canadian National Construction Projects

The Canadian National is receiving bids for the construction of a brick and concrete service and storage garage building for the use of trucks in express service at Vancouver, B. C. Plans have been prepared for the construction of a fuel oil storage tank with a capacity of 50,000 gal. at Kamloops, B. C. Contract for the construction of a two-story brick freight office building, a transfer platform and an addition to the freight sheds at Saskatoon, Sask., has been awarded to P. W. Graham and Sons, Moose Jaw, Sask. The sheds will be about 400 ft. long. With the necessary trackage the project will involve an expenditure of about $250,000. A contract has been let to Claydon Company, Ltd., for the construction of mechanical coaling stations at Sturgis, Sask., Medstead and Hudson Bay Junction.

## *Traffic*

The St. Louis-San Francisco has entered into an agreement with the Inland Waterways Corporation for the interchange of freight at Memphis, Tenn.

"The State Port Authority of Virginia" having charge of Hampton Roads, has established an office in New York City (17 Battery Place) with Harry R. Wood, foreign freight representative, in charge.

The Chicago & North Western, in conjunction with the Union Pacific has reduced freight train schedules between Chicago and Denver by 14 hours. Under the new 54-hr. schedule carload shipments leave Chicago 8:30 a.m., Council Bluffs at 11 a.m. the next morning and arrive in Denver at 2:30 p.m. the following day.

George H. Hutton, superintendent of agriculture and animal husbandry for the department of natural resources of the Canadian Pacific at Calgary, Alta., died near Anaconda, Mont., on June 7.

The Missouri Pacific has moved a total of 1,380 cars of strawberries from northern Arkansas and southern Missouri so far this season and estimates a total for the season of 1,555 carload. Bald Knob, Ark., is the largest concentration point for Ozark strawberries, a total of 994 cars already having been moved from that point. The White River division, between Carthage, Mo., and Newport, Ark., has produced and shipped 137 cars, while the district in and around Joplin, Mo., has shipped 65 cars.

The Illinois Central, the St. Louis-San Francisco and the Chicago, Rock Island & Pacific have established through sleeping car service between New Orleans, La., and Denver, Colo. Cars leave New Orleans at 7:45 p.m. over the Illinois Central; leave Memphis at 7:45 the next morning over the St. Louis-San Francisco; and leave Kansas City at 9:20 p.m. the next night, arriving in Denver at 1:10 p.m. the second day. Returning, cars leave Denver at 11:30 a.m., arrive in Kansas City at 7:45 a.m. the next morning, Memphis at 9:15 p.m. the next night and New Orleans at 10:30 a.m. the second morning.

### Good Freight Time from Chicago

A report made by the service, merchandise and trap-cars committee of the Chicago Shippers Conference Association showed that of a total movement of 32,487 cars out of Chicago during April, 28,761 or 88.53 per cent were arrived at destination on time, 8.67 per cent or 2,815 cars were one day late, 2.28 per cent or 745 cars were two days late and only 0.51 per cent or 166 cars were three or more days late. The schedules of the cars ranged from one to eight days, there being overnight service to points within a radius of 200 to 300 miles of Chicago and eight-day service to practically all Pacific Coast points.

Out of 318 cars moving via six different routes to Denver, Col., 316 were on time. One of the most remarkable performances shown in the report is that of the Chicago, Milwaukee, St. Paul & Pacific. That road moved 53 cars to Aberdeen, S. D., 88 cars to Kansas City, Mo., 73 cars to Seattle, Wash., 49 cars to Spokane, Wash., and 26 cars to Tacoma, Wash., all of which went through on time.

### Ohio Valley Shippers' Board

The 25 commodity committee reports submitted at a meeting of the Ohio Valley Shippers' Advisory Board, which was held at Indianapolis, Ind., on June 5, and which was attended by 700 shippers and railroad representatives, forecast a decrease in the shipments of early summer crops, especially wheat, which has been jeopardized by poor weather conditions. Recultivation because of the loss of wheat will be very large. However, the shipment of fruit crops indicates an increase over last year, while the potato outlook is good. The report of the coal committee shows that the movement of lake coal is being hampered by uncertainties in the rate situation and as a result transportation showed a decrease for the past quarter. The products of mills and factories furnishing building material continue to show a slight falling off over last year, the decrease approximately 10 per cent. The reports from all cities in this territory show better employment conditions than existed at the time of the previous meeting in March.

### Southeast Shippers' Board

Industries in the Southeast expect an early improvement in business according to reports made at the meeting of the Southeast Shippers' Advisory Board held at Savannah, Ga., on June 8. A net volume of business three per cent greater during July, August and September than for the same period last year was predicted. Approximately 600 representatives of shippers and railroads in the Southeast were in attendance.

Commodities whose shipments are expected to decrease include alcohol, 9 per cent; brick, clay and clay products, 20 per cent; coal and coke, 5 per cent; cotton seed and products, 50 per cent; and furniture, 10 per cent. The movement of chemicals and explosives, fertilizer, southern pine, machinery, castings and boilers, naval stores, and sugar is expected to equal that of the same period last year. Increases are expected in the movement of the following commodities: aluminum ingots and sheet steel, 67 per cent; cement, 10 per cent; crushed stone, sand, etc., 2½ per cent; peaches, 40 per cent; grain and grain products, 5 per cent; iron and steel, 45 per cent; hardwood, 15 per cent; petroleum and products, 12 per cent; pulp, paper and products, 5 per cent; and cotton and cotton products, 10 per cent.

J. J. Pelley, president of the Central of Georgia; Mayor Thomas Hoynes, Savannah; Gordon Saussey, general counsel of the Savannah Port Authority; and Anton P. Wright, president of the Savannah Bank and Trust Company, were the principal speakers.

# *Equipment and Supplies*

## Locomotives

THE SOUTHERN PACIFIC contemplates building nine locomotive tenders in its Houston, Tex. shops.

THE GUAYAQUIL & QUITO has ordered 3 Garratt type locomotives from Beyer, Peacock & Co., Ltd., Manchester, England.

## Freight Cars

THE CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA, is inquiring for 250 stock cars.

THE LEHIGH & NEW ENGLAND is inquiring for 6 caboose cars.

THE MANILA RAILROAD is inquiring for 100 box cars of 30 tons' capacity.

THE PUBLIC SERVICE COMPANY OF NORTHERN ILLINOIS, Chicago, is inquiring for 1 flat car.

THE U. S. NAVY DEPARTMENT, Bureau of Aeronautics, is inquiring for 1 tank car, for carrying Helium gas.

THE MONTEVIDEO POST ADMINISTRATION, Montevideo, Uruguay, is inquiring through the car builders for 20 open-top cars.

THE CAMBRIA & INDIANA is having heavy repairs made to 625 all-steel hopper cars, of 55 tons' capacity, at the shops of the Pressed Steel Car Company.

THE AMERICAN OIL COMPANY, Baltimore, Md., ordered 1 three-compartment tank car of 5,000 gal. capacity, from the General American Tank Car Corporation.

THE SOUTH AFRICAN RAILWAYS are inquiring through the car builders for 500 gondola cars of 20 tons' capacity, to have four wheels.

THE UNITED PORTO RICAN SUGAR COMPANY, (San Juan, Porto Rico) is inquiring through the car builders for 22 freight cars of 20 tons' capacity.

## Passenger Cars

THE CHICAGO GREAT WESTERN is inquiring for 3 baggage and mail cars.

THE PACIFIC ELECTRIC is reported to have ordered 18 interurban cars and 10 passenger coaches from the St. Louis Car Company. This road also plans to recondition 198 cars in its own shops.

## Iron & Steel

THE CHICAGO & NORTH WESTERN is inquiring for 125 tons of structural steel for a bridge at Janesville, Wis.

THE READING has ordered 300 tons of steel for a bridge in Philadelphia, from the Shoemaker Bridge Company.

THE TEXAS & PACIFIC has ordered 10,000 tons of 110-lb. rail from the Colorado Fuel & Iron Co. for immediate delivery.

## Machinery and Tools

THE CHICAGO, BURLINGTON & QUINCY is inquiring for one 30-in. by 14 ft. motor driven engine lathe.

## Signaling

THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS has ordered from the General Railway Signal Company 39 engine equipments for automatic train control.

THE TEXAS & PACIFIC has ordered from the General Railway Signal Company materials for automatic block signals on its line from Eastland, Tex., to Toyah, 315 miles. The order includes 453 color-light signals, three-indication; 1,388 relays, and other apparatus.

# *Supply Trade*

**Burton Mudge**, executive vice-president of the **Bradford Corporation**, New York, has been elected first vice-president of this company.

The Chicago sales office of the **Joseph Dixon Crucible Company** is now located in the Builders building, Wacker Drive and LaSalle street.

**M. C. M. Hatch**, Technology Chambers, 8 Irvington street, Boston, Mass., has been appointed representative in the New England territory, for the **Armspear Manufacturing Company**, New York.

**George E. Cornwall** has been appointed supervisor of the railway sales division of the **Heywood-Wakefield Company**. Mr. Cornwall will have his headquarters at the executive offices of the company, Boston, Mass.

**The Standard Railway Equipment Company**, the **Union Metal Products Company**, and the **Railway Metal Products Company**, have moved their offices from the Railway Exchange building to the Shell building, St. Louis, Mo. **A. G. Bancroft** is southwestern sales manager, and **E. G. Fredell** service engineer, at St. Louis.

**A. N. Willsie**, formerly western sales manager of the Locomotive Stoker Company, has been placed in charge of railway sales of the **Gunite Corporation**, Rockford, Ill., recently organized to handle the sales and distribution of Gunite, a graphitic steel.

The **A & H Corporation**, Chicago, has been organized to engage in general railway and industrial supply business. The new company will take over the sales and service of the E. A. Lundy Company in the western territory. It will also handle all Aldobilt products. **C. F. Hopkins**, formerly assistant to the president of the E. A. Lundy Company and **R. B. Arnold**, formerly western manager of the signal division of this company have been elected vice-presidents of the new company.

**The Westinghouse Union Battery Company**, Swissvale, Pa., has been sold to a new company known as the **Wubco Battery Corporation**, recently organized to take over the equipment, inventory, sales outlets and good will of the Westinghouse Union Battery Company. **J. L. Rupp** is president of the new company; he was an executive of the old company and has been active in storage battery development and improvement of standards for the past fifteen years. The manufacture of the same type batteries will be carried on in the present plant.

## Obituary

**Samuel J. Hough**, western manager with headquarters at Chicago, of the Waterbury Battery Company, Waterbury, Conn., was drowned on June 7, at Mattoon, Ill.

**Charles T. Strawbridge**, vice-president of the Bass Foundry & Machine Company, Fort Wayne, Ind., died at his home in Fort Wayne on June 10, at the age of 70. From 1874 to 1879 he was a telegraph operator on the Pennsylvania, and in 1879 entered the service of the Bass Foundry & Machine Company. In 1900 he was elected secretary and two years later became vice-president.

## Trade Publications

INDUSTRIAL TRACTORS AND TRUCKS.—A 40-page catalog entitled "Tructors" issued by The Elwell-Parker Electric Company, Cleveland, Ohio, explains construction features and illustrates and describes the many types of tractors and trucks manufactured by that company.

BULLETIN No. 16 has been issued by the Railway and Locomotive Historical Society (Boston), a pamphlet of 64 pages, illustrated, as usual, with numerous drawings and photographs of locomotives. The leading article is by E. G. Young, "Historical Notes on Locomotive Design, 1769-1840." This article is illustrated by 31 small sketches of historic locomotives beginning with the design of Trevethick, 1801. R. C. Schmid contributes a dozen pages on the Cleveland, Cincinnati, Chicago & St. Louis and its predecessors.

# Construction

ATCHISON, TOPEKA & SANTA FE.—A contract has been awarded to the Roberts and Schaefer Company, Chicago, for the construction of an automatic electric engine coaler at Pekin, Ill.

BESSEMER & LAKE ERIE.—Contracts have been awarded by this road for work in connection with line changes and grade reductions between Filer and Coolspring, Pa. Winston Brothers Company, Minneapolis, Minn., has received the contract for the grading and structural work between Filer and Pardoe, Pa., while a contract for grading Cozad cut and concrete work for an overhead highway bridge has been awarded to the Milliron Construction Company, Du Bois, Pa. The H. E. Culbertson Company, Cleveland, O., has received a contract for the balance of concrete and foundation work. The project is expected to cost approximately $198,500. This company has also closed bids for the construction of an undergrade crossing to eliminate four grade crossings at West Springfield, Pa. The estimated cost of this work is approximately $34,000.

CANADIAN PACIFIC.—Contracts for the construction of branch lines on the Western lines have been awarded as follows: An extension on the Moose Jaw Southwesterly branch from mileage 109, which is 12 miles east of Val Marie, Sask., to mileage 146, 37 miles, to Foley Brothers, Inc., St. Paul, Minn.; an extension of the Leader Southerly branch from Pennant, Sask., to a point 24 miles southwest, to W. A. Dutton, Winnipeg, Man.; an extension of the Fife Lake branch from Coronach, Sask., to a point 20 miles east, to Foley Brothers, Inc.; an extension of the Hak(Sask.)-Coderre branch to a point 12 miles east of Coderre, to Duff Flint & Co., Winnipeg. This company has awarded contracts for the construction of 12 plate girder bridges, six truss bridges and three combined plate girder and truss bridges on the Revelstoke division between Field, B. C., and Revelstoke. The Canadian Bridge Company will construct 13 of the bridges and the Hamilton Bridge Company will construct 8. Five of the bridges will be fabricated by the Manitoba Bridge & Iron Works, seven by J. Coughlan and Sons, Vancouver, B. C., four each by the Dominion Bridge Company and the Hamilton Bridge Company and one by the Canadian Bridge Company. The new bridges will replace existing structures and will allow the operation of heavier locomotives on this division.

CHICAGO, BURLINGTON & QUINCY.—A contract has been let to the Roberts and Schaefer Company, Chicago, for the construction of two-track electric cinder plants at Sterling, Colo., at Sheridan, Wyo., at McCook, Neb., and at Kansas City, Mo.

CLEVELAND UNION TERMINALS.—A contract for the construction of the station building proper and a number of viaducts in connection with the terminal development at Cleveland, Ohio, has been let to the Aronberg-Fried Company, New York.

KETTLE VALLEY.—A contract for realinement and reduction of grade at a point between Jura, B. C., and Jellicoe has been let to Robertson Brothers, Inc., Vancouver, B. C.

OREGON-WASHINGTON RAILROAD & NAVIGATION COMPANY.—Bids have been requested for the construction of a blacksmith shop and an apprentice school building at Albina yard, near Portland, Ore., and the remodeling of an iron house, a flue rattler building, and welding shed and a dynamo and switch house at the same point.

READING.—Contracts have been awarded by this road to Irwin & Leighton, Hughes-Foulkrod Co., and the Shoemaker Bridge Co., Philadelphia, for work in connection with its new North Broad Street Station in Philadelphia. The first received the contract for the erection of the building, the second for platform, grading, masonry and appurtenant work while the work awarded to the third is for steel work in connection with alterations to bridges involved in the project at Cumberland and 13th streets. The estimated cost is approximately $2,000,000.

RICHMOND, FREDERICKSBURG & POTOMAC.—A contract for the construction of this company's new bridge over Powell's Creek, south of Washington, D. C., has been awarded to James S. McCormick Co., Easton, Pa. This project was announced in the *Railway Age* of May 5.

RUTLAND.—This company has awarded a contract to the Railway Engineering & Construction Co., Boston, Mass., for the construction of the substructure of its new bridge over the Winooski river at Burlington, Vt. Bids were recently closed for construction of the superstructure. The work is expected to involve an expenditure of approximately $227,500, of which $50,000 is the estimated cost of the substructure involved in the contract awarded.

ST. LOUIS-SAN FRANCISCO.—This company plans the construction of a passenger station at Pensacola, Fla., on the Muscle Shoals, Birmingham & Pensacola to replace the station now in use at that point.

TORONTO TERMINALS. — This company closed bids on June 12 for the construction of an express and office building for the Canadian Pacific at Toronto, Ont., and on June 7 for the construction of an express and office building for the Canadian National at the same point.

* * * *

*Photo Courtesy of Page Steel & Wire Co.*

**Southern Pacific Property Near El Paso, Tex., Protected by Flexible Chain Link Fence Along Public Highway**

# Financial

ALAMEDA BELT LINE. — *Stock.* — The Interstate Commerce Commision has authorized the issuance of 5,000 shares of stock of a par value of $100 each, 1,130 of which are to be delivered to the Atchison, Topeka & Santa Fe at par and a like amount to the Western Pacific in payment for advances in aid of construction; the remainder to be sold at par and the proceeds used for construction.

ASHLAND. — *Stock.* — The Interstate Commerce Commission has authorized this company to issue $6,000 of capital stock to pay for the property of the former Alabama Northern, a 7.1-mile line in Alabama.

ATCHISON, TOPEKA & SANTA FE.—*Acquisition.*—The Interstate Commerce Commission has authorized this company and the Panhandle & Santa Fe to acquire the Clinton & Oklahoma Western and the Clinton-Oklahoma-Western of Texas, 58 miles in operation and 85 miles under construction. The Santa Fe will acquire control by purchase of capital stock and the Panhandle will operate them under lease.

BIG CREEK & TELOCASET.—*Operation Authorized.*—The Interstate Commerce Commission has authorized this company to operate in interstate and foreign commerce a line extending from a connection with the Oregon-Washington at Telocaset, Ore., southeast to Beagle Creek Jct., 11 miles.

BOSTON & MAINE.—*Equipment Trust.*—The Interstate Commerce Commission has authorized the issuance of $1,875,000 of No. 4, 4½ per cent equipment trust certificates by the National Shawmut Bank of Boston, to be sold at not less than 100.29 of par plus accrued dividends.

CALIFORNIA & OREGON COAST.—*Purchase Option Granted.*—On June 1 the city council of Grants Pass, Ore., granted a 60-day option for the purchase of this railroad to J. F. Reddy, who is acting in behalf of interests, the identity of which was not announced at that time. It is the plan of those who have taken the option to construct an extension from the present southern terminus at Waters Creek, Ore., which is 15 miles from Grants Pass, to Crescent City, Cal., about 60 miles.

GRAND TRUNK WESTERN. — *Michigan Authorities Approve Consolidation.*—Authority for the consolidation of the 11 subsidiaries of this railroad located in the state of Michigan was granted by the Michigan Public Utilities Commission at Lansing, Mich., on June 7.

INTERNATIONAL RAILWAYS OF CENTRAL AMERICA.—*Annual Report.*—The annual report for 1927 shows net income after interest and other charges of $1,992,755. Selected items from the income statement follow:

| INTERNATIONAL RAILWAYS OF CENTRAL AMERICA | 1927 | 1926 |
|---|---|---|
| Average mileage operated | 683.20 | 597.15 |
| RAILWAY OPERATING REVENUES | $7,012,190 | $6,826,574 |
| Maintenance of way | 889,470 | ..... |
| Maintenance of equipment | 853,012 | ..... |
| Transportation | 1,792,315 | ..... |
| NET RAILWAY OPERATING EXPENSES | 4,115,763 | ..... |
| Operating ratio, including taxes | 62.42 | 64.45 |
| NET REVENUE FROM OPERATIONS | 2,896,427 | 2,695,750 |
| Railway tax accruals | 261,081 | ..... |
| Railway operating income | 2,634,944 | ..... |
| Hire of freight cars—Cr. Bal. | 6,644 | ..... |
| Non-operating income | 198,242 | ..... |
| GROSS INCOME | 2,990,307 | ..... |
| Interest on funded debt | 897,236 | ..... |
| TOTAL DEDUCTIONS FROM GROSS INCOME | 997,552 | ..... |
| NET INCOME | 1,992,755 | ..... |
| Disposition of net income | | |
| Income applied to sinking funds | 86,558 | ..... |
| Dividend appropriations of income | 500,000 | ..... |
| Income balance carried to profit and loss | 1,406,196 | ..... |

KANSAS CITY, MEXICO & ORIENT.—*Report of Sales of Stock to Santa Fe.*—Both W. T. Kemper, president of the Orient and W. B. Storey, president of the Atchison, Topeka & Santa Fe, on June 11 declined to comment on the rumor which gained currency on June 8 that the Santa Fe had purchased from English stockholders 40 per cent of the outstanding stock of the Orient. Mr. Storey, when asked to confirm the report, declined to comment on either that particular transaction or on the possibility of such a sale. Mr. Kemper in speaking for the Orient declared that he had nothing to say in reference to the acquisition of that railroad by the Santa Fe.

KANSAS CITY, MEXICO & ORIENT.—*Court of Appeals Sustains Reorganization Plan.*—The United States Circuit Court of Appeals at St. Paul, Minn., has handed down an opinion in connection with the reorganization of this railroad which authorizes the payment of $800,000 in fees, covering a 10-year period of receivership and reorganization, to William T. Kemper, president and former receiver, and Clifford Histed, vice-president and general counsel. In this decision the court of appeals reduced the earlier award of the Kansas district of the federal court which had set the total compensation at $1,069,000. Mr. Kemper will receive $40,000 per year and interest charges for the 10-year period under the appellate court's decision and Mr. Histed will receive $35,000 per year and interest. These two officers of the Orient will take the compensation in stock which will give the Kansas City group of stockholders, headed by Mr. Kemper, a majority interest in the railroad and make the paying of the compensation largely a "bookkeeping" matter. The court approved the entire plan of reorganization, although it ruled the British noteholders should be allowed further opportunity to participate in the new company. All criticism of the receiver and his counsel and the reorganization plan which had been made by the British noteholders was disapproved by the court. The settlement of this litigation will now make it possible for the Orient to proceed with new construction and improvement of the road.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—*Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority for an issue of $1,260,000 of 4 per cent equipment trust certificates, to be sold to a syndicate consisting of the Illinois Merchants Trust Company, Harris Trust & Savings Bank, Chicago, the Minnesota Loan & Trust Company and the First Minneapolis Trust Company, of Minneapolis.

CHICAGO, SPRINGFIELD & ST. LOUIS.—*Acquisition.*—This company has applied to the Interstate Commerce Commission for authority to acquire and operate the Jacksonville & Havana and to operate over the tracks of the Chicago, Burlington & Quincy between Waverley and Jacksonville, Ill.

NEW YORK CENTRAL.—*Stock.*—This company has applied to the Interstate Commerce Commission for authority to issue $42,158,300 of additional stock to provide in part for the retirement at maturity, on September 1, of $50,000,000 of 25-year 4 per cent bonds of the Lake Shore & Michigan Southern. The stock is to be offered at par to the stockholders of record on June 15 on the basis of one share for each ten held.

NEW YORK CENTRAL.—*Sales of Utilities Stocks.*—The New York Central has concluded negotiations for the sale of its majority holdings in the Mohawk Valley Company at $75 a share and its holdings of common stock of the New York State Railways at $25 a share, the total involved being approximately $42,000,000. Purchasers are a group of New York utility interests and financial houses.

NORTHERN PACIFIC.—*Annual Report.*—The annual report for 1927 shows net income after interest and other charges of $18,538,424 as compared with net income in 1926 of $21,002,732. Selected items from the income statement follow:

| NORTHERN PACIFIC | 1927 | 1926 |
|---|---|---|
| Average mileage operated | 6,669.95 | 6,682.35 |
| RAILWAY OPERATING REVENUES | $95,574,816 | $97,351,042 |
| Maintenance of way | 11,965,278 | 12,297,403 |
| Maintenance of equipment | 17,865,172 | 17,414,638 |
| Transportation | 31,902,292 | 32,291,965 |
| TOTAL OPERATING EXPENSES | 67,854,739 | 68,260,944 |
| Operating ratio | 71. | 70.12 |
| NET REVENUE FROM OPERATIONS | 27,720,078 | 29,090,098 |
| Railway tax accruals | 8,907,124 | 9,151,147 |
| Railway operating income | 18,792,944 | 19,918,278 |

| | | |
|---|---|---|
| Equipment rents—net | 1,728,209 | 2,300,954 |
| Joint facility rent—net | 2,071,683 | 1,994,468 |
| NET RAILWAY OPERATING INCOME | 22,592,837 | 24,213,700 |
| Non-operating income | 11,435,064 | 12,093,575 |
| GROSS INCOME | 34,027,901 | 36,307,276 |
| Rent for leased roads | 51,471 | 51,321 |
| Interest on funded debt | 14,714,082 | 14,774,879 |
| TOTAL DEDUCTIONS FROM GROSS INCOME | 15,489,477 | 15,304,544 |
| NET INCOME | 18,538,424 | 21,002,732 |

ST. LOUIS-SAN FRANCISCO.—*Annual Report.*—The annual report for 1927 shows net income after interest and other charges of $7,464,235, equivalent after allowance for dividends on the preferred stock, to $10.75 per share on the outstanding common stock. Net income in 1926 was $7,546,153, or $14.17 per share. Selected items from the income statement follow:

| ST. LOUIS-SAN FRANCISCO | 1927 | 1926 |
|---|---|---|
| Average mileage operated | 5,605.24 | 5,602.63 |
| RAILWAY OPERATING REVENUES | $89,259,584 | $94,406,054 |
| Maintenance of way | 11,910,297 | 12,708,773 |
| Maintenance of equipment | 13,697,915 | 14,672,383 |
| Transportation | 29,628,234 | 31,215,306 |
| TOTAL OPERATING EXPENSES | 62,263,277 | 65,921,910 |
| Operating ratio | 69.76 | 69.81 |
| NET REVENUE FROM OPERATIONS | 26,996,307 | 28,484,144 |
| Railway tax accruals | 4,992,531 | 4,842,388 |
| NET RAILWAY OPERATING INCOME | 22,023,459 | 23,238,575 |
| Non-operating income | 1,530,294 | 403,974 |
| GROSS INCOME | 23,553,753 | 23,642,550 |
| TOTAL DEDUCTIONS FROM GROSS INCOME | 577,754 | 603,690 |
| Balance available for interest, etc. | 22,975,999 | 23,038,860 |
| NET INCOME | 7,464,235 | 7,546,153 |
| Interest on fixed charge obligations | 10,969,153 | 10,950,177 |
| Interest on adj. bonds | 2,432,291 | 2,432,209 |
| Interest on income bonds | 2,110,320 | 2,110,320 |
| Balance | 7,464,236 | 7,546,154 |
| Dividends on preferred stock | 428,022 | 420,698 |
| Dividends on common stock | 4,352,229 | 3,431,973 |
| Balance | 2,683,985 | 3,693,483 |

## Valuation Reports

The Interstate Commerce Commission has issued final valuation reports finding the final value for rate-making purposes of the property owned and used for common-carrier purposes, as of the respective valuation dates, as follows:

| | | |
|---|---|---|
| Durham & Southern | $966,300 | 1917 |
| Brimstone R. R. & Canal Co. | 187,000 | 1918 |
| Toledo, St. Louis & Western | $17,376,540 | 1916 |

## Dividends Declared

Albany & Susquehanna.—4½ per cent, semi-annually, payable July 1 to holders of record June 15.

Boston & Maine.—Preferred, 1¾ per cent, quarterly; first preferred Class A, 1¾ per cent, quarterly; first preferred Class B, 2 per cent, quarterly; first preferred Class C, 1¾ per cent, quarterly; first preferred Class D, 2½ per cent, quarterly, and first preferred Class E, 1¾ per cent, quarterly, all payable July 2 to holders of record June 15.

Belgian National Railways.—Par. preferred (Am. sh.) $1.86, payable June 15 to holders of record June 5.

Beech Creek.—$0.50, quarterly, payable July 2 to holders of record June 15.

Buffalo & Susquehanna.—2 per cent, semi-annually, payable June 30 to holders of record June 15.

Chicago, Indianapolis & Louisville.—Common, 2½ per cent; common (extra), 1 per cent; preferred, 2 per cent, all payable July 10 to holders of record June 23.

Lehigh Valley.—Common, $0.87½, quarterly; preferred, $1.25, quarterly, both payable July 2 to holders of record June 16.

Morris & Essex.—$1.75, quarterly, payable July 2 to holders of record June 8 to June 27.

New York, Lackawanna & Western.—1¾ per cent, quarterly, payable July 2 to holders of record June 14.

Rensselaer & Saratoga.—4 per cent, payable July 1 to holders of record June 6 to July 1.

St. Louis, Rocky Mountain & Pacific.—Common, ½ per cent, quarterly; preferred, 1¼ per cent, quarterly, both payable June 30 to holders of record June 15.

Southern.—Common, 2 per cent, quarterly, payable August 1 to holders of record July 2.

Southern.—Preferred, 1¼ per cent, quarterly, payable July 16 to holders of record June 19.

Wabash.—Preferred A, $1.25, quarterly, payable August 24 to holders of record July 25.

## Average Prices of Stocks and of Bonds

| | June 12 | Last week | Last year |
|---|---|---|---|
| Average price of 20 representative railway bonds | 93.88 | 94.64 | 93.67 |
| Average price of 20 representative railway stocks | 116.89 | 123.51 | 112.61 |

* * * *

**Fast Express That Runs Between Budapest, Hungary, and Trieste on the Adriatic**

# *Officers*

## Executive

**W. L. Trammell** has been elected vice-president of the Arizona Southern, with headquarters located at El Paso, Texas.

**Walter M. Kelly,** assistant vice-president of the Rutland, Toluca & Northern, with headquarters at Toluca, Ill., has been elected vice-president, with headquarters at Minonk, Ill.

## Financial, Legal and Accounting

**A. J. Messersmith** has been appointed auditor of the Chicago, Rock Island & Gulf, with headquarters at Fort Worth, Tex.

**Louis P. Wohlfeil,** acting general auditor of the Green Bay & Western, with headquarters at Green Bay, Wis., has been promoted to general auditor, with headquarters at the same point.

**Arthur C. Durfee,** assistant treasurer of the Buffalo, Rochester & Pittsburgh, with headquarters at Rochester, N. Y., has been appointed treasurer, with the same headquarters. **Axel L. Genzmer,** assistant auditor, with headquarters at Rochester, has been appointed auditor, with headquarters at the same point. Both the above appointments are effective July 1.

**D. Hamilton,** auditor of disbursements and accountant of the Temiskaming & Northern Ontario, with headquarters at North Bay, Ont., has been appointed auditor of disbursements, receipts and accountant following the consolidation of the offices of auditor of disbursements and auditor of receipts and the resignation of **R. H. Mitchell**

who occupied the latter position. **H. H. McGee,** special auditor at North Bay, has been promoted to assistant auditor of disbursements with headquarters at the same point. **H. W. Teskey,** assistant auditor of claims, assistant auditor of receipts and freight claim agent, has been appointed auditor of claims and assistant auditor of receipts, with headquarters at North Bay.

**John F. Dinkey,** auditor and treasurer of the Buffalo, Rochester & Pittsburgh at Rochester, N. Y., will retire under the pension regulations on June 30, after having served 47 years with that road. Mr. Dinkey was born at South Easton, Pa., on October 16, 1854. He entered railway service on April 1, 1874, as chief clerk in the freight and coal departments of the Lehigh & Susquehanna division of the Central of New Jersey. From August, 1878, to February, 1881, he served as chief clerk in the general manager's office of the New York Elevated and at the latter time he became auditor and assistant treasurer of the Rochester & Pittsburgh and its successor, the Buffalo, Rochester & Pittsburgh. He was appointed auditor and treasurer of the same road and its affiliated companies in January, 1890, and has served in that capacity up until the present time.

## Operating

**Norris C. Taylor,** secretary-treasurer of the Arkansas Short Line, with headquarters at Truman, Ark., has in addition been appointed traffic manager.

**M. Magiff,** superintendent of telegraph and car service on the Central Vermont at St. Albans, Vt., has retired after 61 years of continuous service with that road.

**Andrew Lester** has been appointed superintendent of the Louisiana Southern, with headquarters at New Orleans, La. Mr. Lester succeeds **F. E. Prewett,** retired, who held the title of general manager.

**R. M. Hoover,** inspector of transportation of the Southern Pacific, with headquarters at Houston, Tex., has been appointed acting superintendent of the Beaumont division, with headquarters in the same city, replacing **H. J. Micksh** who has been granted a leave of absence.

**G. W. Bradley,** trainmaster of the Fort Wayne division of the Pennsylvania, with headquarters at Fort Wayne, Ind., has been transferred to the Indianapolis division, with headquarters at Indianapolis, Ind., succeeding **E. A. Burchiel,** who has been transferred to the Fort Wayne division to replace Mr. Bradley.

## Traffic

**J. C. Kimes,** assistant general freight agent of the Baltimore & Ohio, with headquarters at Cleveland, Ohio, has been promoted to general freight agent, with headquarters at Chicago.

**W. R. Lence,** general manager of the Abilene & Southern, with headquarters at Abilene, Tex., has in addition been appointed general freight and passenger agent.

**H. G. Schuette,** assistant general agent for the Great Northern at Detroit, Mich., has been promoted to general agent at that point, succeeding **E. B. Clark,** who has been appointed commercial agent at Detroit.

**F. H. Faus,** general agent on the Chicago, Rock Island & Pacific at Colorado Springs, Colo., has been transferred to Denver, Colo., succeeding **G. W. Martin,** who has been granted a leave of absence because of ill health.

**C. F. Farmer,** division freight agent of the Baltimore & Ohio at Youngstown, O., has been appointed assistant general freight agent, with headquarters at Cleveland, O., succeeding J. C. Kimes, promoted.

**T. W. Jacobs** has been appointed European traffic manager of the Baltimore & Ohio, reporting on matters pertaining to passenger traffic to W. B. Calloway, passenger traffic manager at Baltimore, Md., and on matters pertaining to freight traffic to Golder Shumate, general freight traffic manager at Baltimore. Mr. Jacob's headquarters will be in London, England.

**B. C. Taylor,** who has been promoted to general passenger agent of the Southern Pacific, with headquarters at Portland, Ore., has been connected with the traffic department of that railroad for 15 years. He entered railway service in 1907 as a freight trucker on the

B. C. Taylor

Oregon Railroad & Navigation Company (now part of the Union Pacific System) at Baker, Ore. For six years previous to that time he had been a telegrapher for the Western Union. Mr. Taylor's later service with the O. R. & N. included the positions of receiving clerk, bill clerk, revising clerk, cashier and telegrapher-ticket clerk. In February, 1911, he became a ticket clerk in the Union Depot ticket office at Portland, where he remained until June, 1913, when he entered Southern Pacific service as a clerk in the general passenger office at Portland. Mr. Taylor was promoted to traveling freight and passenger agent, with headquarters at Seattle, Wash., in September, 1915, and was transferred to Portland in June, 1917. During the World war he served in the Army in the Signal corps and in the Gas service, spending nearly two years overseas. Upon his discharge from the Army he was appointed traveling agent at Eugene, Ore., where he remained until March 1, 1920, when he was transferred to Seattle. Mr. Taylor was promoted to general agent at Seattle on August 1, 1923, his advancement to general passenger agent at Portland becoming effective on June 1.

**John M. Scott,** who retired from active railroad service on June 1 as assistant passenger traffic manager of the Southern Pacific, with headquarters at Portland, Ore., has been connected with railroads for 43 years and with the Southern Pacific for 27 years. He was born at Inverness, Scotland, on September 1, 1864, and entered railway service in 1885 on the Grand Trunk at Montreal, Que., where he remained until 1888 when he came to the United States and became connected with the Chicago, Burlington & Quincy at Omaha, Neb. From 1891 to 1893, Mr. Scott was with the Missouri Pacific at St. Louis, Mo., and he was then appointed chief rate clerk of the Union Pacific at Omaha. In 1901 he was appointed chief passenger clerk to the traffic director of the Harriman Lines—the Union Pacific and the Southern Pacific—at Chicago, being promoted to assistant general passenger agent of the Southern Pacific, with headquarters at Portland in 1906. Mr. Scott was advanced to general passenger agent at Portland in 1911 and 12 years later he was promoted to assistant passenger traffic manager.

## Engineering, Maintenance of Way and Signaling

**H. E. Beard,** assistant chief engineer of the Kansas City, Mexico & Orient, with headquarters at Wichita, Kan., has been appointed acting chief engineer, with headquarters at the same point.

**J. J. Taylor,** superintendent of bridges and buildings of the Kansas City Southern, with headquarters at Texarkana, Tex., retired from active duty on June 1 after 26 years of service in the engineering department of that railroad.

**J. C. Poffenberger,** division engineer on the Conemaugh division of the Pennsylvania, with headquarters at Pittsburgh, Pa., has been transferred in the same capacity to the Middle division, with headquarters at Altoona, Pa., succeeding R. P. Graham, promoted.

**Wayne J. Burton,** assistant valuation engineer of the Missouri Pacific, with

headquarters at St. Louis, Mo., has been promoted to assistant to the chief engineer, with headquarters at the same point. Mr. Burton was born in Berrien County, Mich., on November 29, 1882, and graduated from Purdue University in June, 1903. He entered railway service immediately after graduation from college in the engineering department of the Baltimore & Ohio. In June, 1905, he was appointed assistant roadmaster on the Missouri Pacific, then advancing to assistant engineer and being promoted to division engineer at Pueblo,

Wayne J. Burton

Colo., in 1907. Later he was transferred to St. Louis and until 1914 he acted in that capacity, as general roadmaster and as designing engineer. Mr. Burton was then promoted to assistant valuation engineer. His promotion to assistant to the chief engineer became effective on June 1.

## Mechanical

**J. E. Brower,** master mechanic on the Central region of the Pennsylvania, with headquarters at Pittsburgh, Pa., has been transferred to Ft. Wayne, Ind., with jurisdiction over the Ft. Wayne, the Grand Rapids and the Logansport divisions.

**Russell G. Henley,** who has been appointed superintendent of motive power on the Norfolk & Western at Roanoke, Va., was born at Edgemont, King and Queen County, Va., on May 17, 1884. He served a special apprenticeship with the Richmond Locomotive Works and entered the service of the Norfolk & Western on September 5, 1905. In December, 1908, he was appointed assistant roundhouse foreman at Bluefield, W. Va., and in June, 1911, he became night roundhouse foreman at Williamson. The following year he was made day roundhouse foreman. From December, 1915, to June, 1916, he served as foreman at East Radford, Va., being appointed general foreman on the latter date. He was advanced to the position of master mechanic of the Pocahontas division on February 15, 1918, and in November of the same year he was transferred to the Scioto division in the same capacity. He was appointed assistant to the superintendent of motive

Russell G. Henley

power at Roanoke on February 1, 1918, and served in that capacity until his recent promotion to superintendent of motive power.

## Purchases and Stores

**G. E. Bacheller** has been appointed purchasing agent of the Intermountain, with headquarters located at Boise, Idaho.

**D. B. Rivers,** district storekeeper on the Chicago, Milwaukee, St. Paul & Pacific, with headquarters at Miles City, Mont., has been transferred to Minneapolis, Minn., to succeed **George T. Richards,** resigned. **J. V. Anderson,** assistant district storekeeper at Minneapolis, has been promoted to district storekeeper at Miles City, replacing Mr. Rivers.

## Obituary

**Joseph W. Walker,** assistant to the general manager of the Coast lines of the Atchison, Topeka & Santa Fe, with headquarters at Fresno, Cal., died at his home in that city on June 7 following an extended illness. A sketch of Mr. Walker's career and a reproduction of his photograph appeared in the Railway Age of April 14, 1928, page 895, on the occasion of his promotion to assistant to the general manager.

**M. Larson,** chief engineer of the Railroad Commission of Wisconsin since 1913, died at Madison, Wis., on June 9. Mr. Larson had been connected with the engineering departments of several railroads, entering that service in 1902 as transitman on preliminary surveys for the Alaska Central. Later he served for two years as assistant resident engineer of the National Railways of Mexico and as chief engineer of the Cordoba & Huatusco, for three years as real estate engineer of the Chicago & Alton and for a year in the valuation department of the New York Central.

**John Mitchell Johnson,** formerly vice-president of the Chicago, Rock Island & Pacific, the Missouri Pacific, the Denver & Rio Grande and the Western Pacific, died at Palo Alto, Cal., on June 5 at the age of 83 years. Mr. Johnson retired from active railway service in 1918 and since that time had made his home in California. He was born on May 13, 1845, at Cincinnati, Ohio. During the Civil War, from September, 1861, to May, 1865, Mr. Johnson served as a private and a sergeant in the Seventh Indiana infantry. He entered railway service on January 1, 1871, as station agent on the Indianapolis, Cincinnati & Lafayette (now part of the Cleveland, Cincinnati, Chicago & St. Louis) at Franklin, Ind. For the next 25 years he served in that position, as general freight and ticket agent, as traveling auditor and as assistant general freight agent of a number of lines which are now parts of the Big Four and as first assistant general freight agent and general freight agent of the Rock Island. Mr. Johnson was promoted to freight traffic manager of the Rock Island, with headquarters at Chicago in March, 1896, and was elected third vice-president in March 1899. From April 1903, until November, 1907, he acted as assistant to the vice-president of

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the Gould Lines, and in addition as chairman of the Western Classification Committee and as a member of the Uniform Classification Committee representing the Western Freight Association. He then served for the next 10 years as vice-president in charge of traffic of the Missouri Pacific and the St. Louis, Iron Mountain & Southern (now a part of the former railroad), with headquarters at St. Louis, Mo. Mr. Johnson also acted from July, 1913, to November, 1915, as vice-president in charge of traffic of the Denver & Rio Grande and from July, 1913, to March, 1915, as vice-president in charge of traffic of the Western Pacific. From June, 1917, until his retirement from active service in April, 1918, he was vice-president of the Missouri Pacific, with headquarters at Chicago, with special duties as assigned.